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1. McKinsey study: http://www.datacenterknowledge.com/archives/2009/04/15/mckinsey-data-centers-cheaper-than-cloud/. 2. Comparison of IBM System x3850 X5 + MAX5 with total 96 DIMMs x 16 GB for total 1.5 TB of memory vs. IBM System x3850 M2 with 32 DIMMs x 8 GB = 256 GB. Comparison of processor-based licensing fees on current Generation 4 processor systems with 64 DIMMs vs. the IBM System x3690 + MAX5. IBM eXFlash technology would eliminate the need for a client to purchase two entry-level servers and 80 JBODs to support a 240,000 IOPs database environment, saving up to 97% in server and storage acquisition costs. IBM, the IBM logo, ibm.com, X-Architecture, Smarter Planet and the planet icon are trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. A current list of IBM trademarks is available on the Web at www.ibm.com/legal/copytrade.shtml. Intel, the Intel logo, Xeon and Xeon Inside are trademarks or registered trademarks of Intel Corporation in the United States and other countries. © International Business Machines Corporation 2010.

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TOO MANY VENDORS

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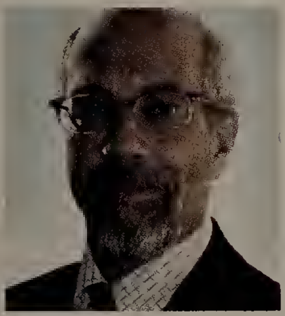
FROM THE EDITOR | JOHN DIX

A healthy glow from Interop

If the annual Interop conference in Las Vegas is a bellwether of industry health, than the recent show reflected a certain vibrancy. Attendee levels seemed steady and show goers packed into conference sessions to hone their knowledge and roamed the floor to see the latest tech wares.



HP had the big anchor booth front and center, which was bordered by large Cisco and Avaya pavilions, all of which were well traveled. But two of the hottest booths belonged to VMware (which you would expect given the virtualization craze) and Arista, which used the expo to showcase the 7500 it announced late last month, the industry's highest density 10G Ethernet switch.

One distressing sign: there were only a few vendors in Start-up City, presumably a reflection of the tight capital markets. But one start-up flying its colors was JouleX, a company selling an agentless energy management system designed to monitor equipment energy consumption and control usage with policies.

Of course a lot of show talk swirled around cloud computing. IBM gave one cloud keynote address and another featured speakers from VMware and Citrix. But the conference sessions on cloud weren't overly packed, showing the vendors are still way out in front on this one, waiting for buyer interest to materialize.

One vendor telling a sensible cloud story at the show was F5 Networks, which unveiled a parcel of tools designed to help maintain the security and performance of, and access controls for, increasingly mobile virtual resources, even if those resources are just moving around inside a private cloud.

Other vendors at the show with interesting stories included NComputing and Internap. NComputing's booth was packed with folks who wanted to learn more about the company's low-cost virtual desktop offerings. CEO Stephen Dukker says desktop virtualization hasn't taken off because the mainstream players are charging too much. Virtual desktop tools have to provide front-end and capex savings, he says. That's hard when the virtualization layer alone costs $200 per desktop. His company offers the software layer and the thin client starting at $100.

And Internap used the show to introduce Accelerated IP (XIP), a way to natively accelerate wide-area IP traffic by up to 400%. XIP complements the company's Performance IP service, through which Internap routes customer traffic across the best possible ISP links — it has relationships with all the big outfits — based on current performance metrics. XIP then tunes the TCP session by futzing with things such as recovery rates to further optimize performance, all without requiring additional appliances or other changes.

Taken together, the developments at Interop made it clear that tech buyers are still looking for answers to complex questions and innovation continues apace. IT still matters.

John A. Dix

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peersay

Google Apps vs. Microsoft Office: Cost trumps functionality

I USE THE consumer version of Google Apps and will be the first to say that its spreadsheet functionality and usability is not even close to that of MS Excel. (Re: Google Apps vs. Microsoft Office; tinyurl.com/29lubh6.) However, for basic spreadsheets, there's some strong arguments for Google Apps.

As the IT guy for a small business (25 heads), I have deployed OpenOffice, which works just fine for all of our internal business processes. Because OpenOffice has some minor formatting issues when handling MS Office docs from external partners, a couple of our users have MS Office.

Personally, I think we don't even need MS Office, but sometimes it's not worth dealing with the drama. So, Google Apps for those that only need the basics. OpenOffice for those that need advanced functionality. MS Office for the rare occasions when perfect compatibility outweighs costs .

Anon

MICROSOFT APPS ARE better than Google's, but so what? Apple PCs are twice as good as Windoze but they cost three times as much and aren't a cost-effective alternative for those worried about price. MS Word is now the gold standard for editors, but if my business can get by with bronze medal software and save money, then we will.

As far as support, well it is true that Microsoft has a help desk you can call and chances are someone will actually answer the phone and talk to you. But whether they will fix your problem is a whole other deal.

Gold-plated software is probably worth the price, especially to those who can afford it, but to those who are making choices about where to spend their money, they will get by with somewhat less functionality for a lot less money.

Mike M

Is Apple just under its own spell?

APPLE WILL SOON be suing Disney for trademark infringement, claiming that it thought of the term 'magical' before Disney did. (Re: Dear Apple: Please make 'magical' disappear from iPad pitches; tinyurl.com/22n4m4n.)

The word 'apple' will be next, forcing grocers to refer to the fruit as 'something that you eat once a day to keep the doctor away' or 'the fruit formally known as an apple'.

Anon

LET ME KNOW what you think of the iPad after you have used one for a week.

The A4 processor is a truly modern marvel. I have no idea where it is located inside the iPad, because it doesn't appear to produce any heat. I used my iPad for 8 hours straight, watching TV, movies, YouTube, reading books, playing games, and surfing the Web. All this with nearly flawless execution. The only bottleneck I found was with Internet bandwidth. Is the device "magic"? Of course not. Is the device "magical"? You bet.

Anon

Closing in on open source

I THINK IT is a misunderstanding that "open source" means "open decision making." To the contrary most open source projects are managed by benevolent dictators (Linus?) who decide what gets committed to the tree. (Re: Is Android truly open source?; tinyurl.com/26r7oug.)

The difference is that you have access to the source so you can add and change anything you want and create your own variant. So yes, if you need a machine to actually execute this change then that is your problem. The only real debate arises if that hardware is in your possession, but is locked down to not allow loading the changed software. And by the way, even HTC is in their rights, as Apache 2.0 license does allow for proprietary changes and enhancements.

Anon

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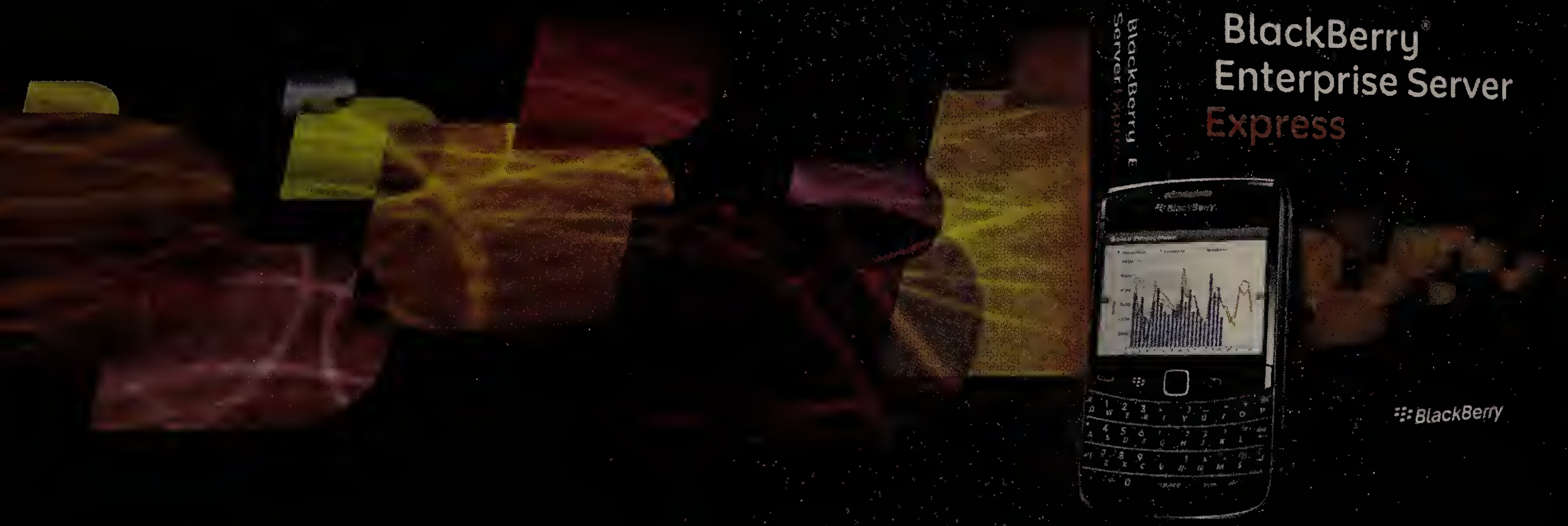
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bits

New year + new job = Green light to talk about ATM hacks

ONE YEAR AFTER his Black Hat talk on ATM security vulnerabilities was yanked, security researcher Barnaby Jack plans to deliver the talk and disclose a new multi-platform ATM rootkit at the upcoming Las Vegas computer security conference. Jack will also demonstrate several ways of attacking ATM machines, including remote, network-based attacks, and lay out what the industry can do to protect against such hacks. Jack was set to discuss ATM security problems at last year's conference, but his employer, Juniper Networks, made him pull the presentation after complaints from an ATM maker. Last month Jack found a way around Juniper's objections: He took a new job as director of security research at IOActive. ***tinyurl.com/254lqz4***

FCC's broadband reclassification: What's next?

THE U.S. Federal Communications Commission is moving quickly to claim some regulatory authority over broadband after Chairman Julius Genachowski announced plans to reclassify broadband from a largely unregulated information service to a regulated common-carrier service. Announced last week, the reclassification effort stems from an appeals court decision in April that ruled the FCC does not have the authority to enforce informal network neutrality rules in a case involving Comcast's throttling of peer-to-peer traffic. Genachowski's plan is designed to reassert the limited authority the FCC thought it had before the Comcast decision, said Bruce Liang Gottlieb, chief counsel to Genachowski. "This is ... not a series of decisions and proposals that is meant to change policies," he said. "Quite the opposite. It's meant to create a solid foundation for a consensus around the agency's role and authority with respect to broadband." ***tinyurl.com/34eam8j***

802.11n on smartphones? Not so fast

DON'T HOLD your breath for smartphones with lightening-fast data capabilities. Sure, next-generation devices will be able to access the Internet at higher speeds, but costs and technical issues will limit the gains. Why? Blame it on MIMO. Multiple-Input Multiple-Output technology is the key to 802.11n's improved performance. It uses multiple antennas in the access point and on the device to send data up to a theoretical 300Mbps. But here's the rub: While many of the newest smartphones — including the Nokia N8, RIM's Pearl 3G and Samsung's Galaxy S — support the 802.11n specification, they lack support for MIMO. So a theoretical 300Mbps drops to 75Mbps, and the actual throughput is expected to be more like 35Mbps. Another drawback with 802.11n on smartphones: It will only work at 2.4GHz; the 5GHz-band has more channels available, which means more users can get higher speeds. ***tinyurl.com/287zjec***

Chrome gets Flashy

GOOGLE'S LATEST version of Chrome improves JavaScript performance by 30% and adds the ability for users to save their browser preferences (such as themes and language) and apply them to multiple PCs via their Google accounts. Google Chrome 5.0.375.29 also adopts several HTML5 features, including geolocation APIs, application caching and drag-and-drop capabilities. In addition, the beta version for the first time integrates Adobe Systems' Flash player plug-in. Besides improving the experience of viewing Flash content and applications, the integration could improve the overall security of Internet browsing, said Al Hilwa, an IDC analyst. At the end of April, Chrome ranked third in market share with a 6.7% slice of the pie, ahead of Apple's Safari (4.7%) and behind market leader Internet Explorer (59.9%) and Firefox (24.6%), according to Net Applications. But IE continues to lose share while Chrome makes steady gains. ***tinyurl.com/25l7thv***

IT VIDEO

Desktop virtualization on an iPad

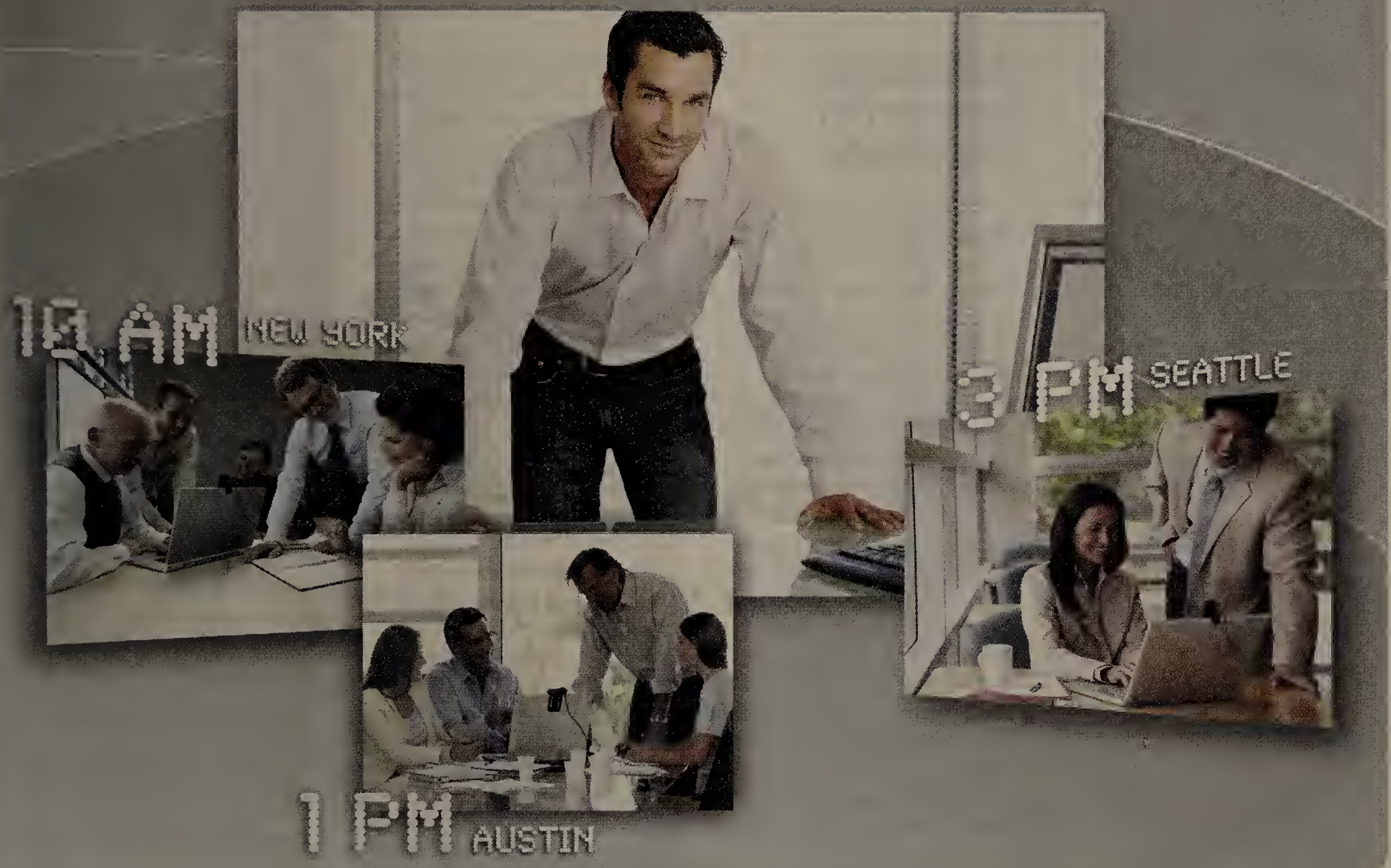
At Interop 2010, Citrix officials demonstrate how to virtualize a desktop screen and display it on an Apple iPad.
tinyurl.com/33mtxad

Michael Capellas to lead Cisco-EMC joint venture

FORMER COMPAQ CEO Michael Capellas is taking the helm of the Acadia joint venture which was created to support a partnership between EMC, Cisco and VMware called the Virtual Computing Environment coalition. The services venture will build, sell and support data centers using modular packages called Vblocks, which incorporate Cisco's servers

MICHAEL CAPELLAS

3 agencies, 3 cities, 1 day? **No problem.**



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and network components, EMC's storage and VMware's virtualization tools. As CEO of Acadia, Capellas will have overall responsibility for the VCE partnership and report to Cisco CEO John Chambers and EMC CEO Joe Tucci. Capellas was CEO of Compaq when it was acquired by HP and most recently served as CEO and chairman of First Data, a payment processing company. He also serves on Cisco's board of directors. ***tinyurl.com/28q9qer***

Lessons from LoveBug

WHEN THE LoveBug worm hit 10 years ago people were still gullible enough to believe admirers were reaching out to say "I love you", personal firewalls were turned off by default, and executable attachments weren't blocked at e-mail gateways. Those circumstances allowed the Love Letter worm — the first Visual Basic script worm — to infect more than 50 million computers within a week, bringing down networks and causing an estimated $5 billion to $8 billion in damages. ILOVEYOU wasn't the first mass-mailing worm, but it was unique in that it knew no limits, says Roger Thompson, chief research officer for security vendor AVG. The attack was a wildly successful case of social engineering — which remains one of the most effective methods of attacking a network. "There's no patch for foolishness," Thompson says. ***tinyurl.com/2w95r5x***

Feds shred counterfeit Cisco trade

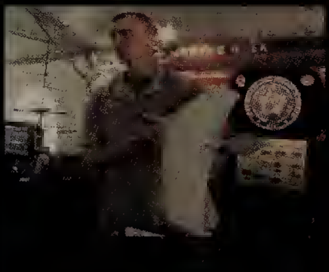
THE FEDS are cracking down on criminals like Ehab Ashoor who sell counterfeit Cisco gear in the United States, thanks to a joint initiative that includes the FBI, U.S. Immigration and Customs Enforcement, and U.S. Customs and Border Protection. Ashoor, 49, was sentenced last week in the Southern District of Texas to 51 months in prison and ordered to pay $119,400 in restitution for trafficking in counterfeit Cisco products. His conviction is part of a federal action known as Operation Network Raider that has resulted in 30 felony convictions and more than 700 seizures of counterfeit Cisco network gear with an estimated retail value of $143 million. Operation Network Raider has driven a 75% decrease in seizures of counterfeit network hardware at U.S. borders from 2008 to 2009. "These cases involve greedy businessmen hocking counterfeit and substandard hardware to any buyer — whether it could affect the health and safety of others in a hospital setting or the security of our troops on the battlefield," said John Morton, assistant secretary of homeland security for ICE. "They pose a triple threat to our nation by stealing from our economy, threatening U.S. jobs and potentially putting the safety of our citizens at risk." ***tinyurl.com/2uf9xyn***

SaaS adoption on the rise

COMPANIES ARE jazzed about software-as-a-service applications — but not in any formal kind of way. Gartner found that more than 95% of IT and business management professionals expect to maintain or grow their use of SaaS. Meanwhile, just 39% of IT pros surveyed said they have policies in place to govern the evaluation and use of SaaS. The most popular SaaS applications identified by Gartner are e-mail, accounting, sales force automation and customer service, and expense management. On the downside, some organizations have found SaaS offerings to be less than optimal, and 16% of respondents said they're transitioning from SaaS to on-premises solutions. ***tinyurl.com/2dav6rn***

Unhappy but staying put

AT&T'S SERVICE is so bad... that customers are sticking with it. A new survey found AT&T customers are twice as likely to be unsatisfied with their cellular service as Verizon customers. ChangeWave Research asked 4,000 respondents to rate various aspects of their cellular services, and AT&T placed last in every category—from dropped calls, where Verizon's rate is almost five times lower, to customer satisfaction, where only 19% of AT&T customers profess themselves to be "very satisfied" with the company's performance. Still, the customers' unhappiness isn't enough to prompt them to switch to a different carrier. Only 8% of customers interviewed said they were likely to switch providers over the next 90 days. ***tinyurl.com/2e87zfg***



IT VIDEO

U.S. Marines show off battlefield tech

Last week, the United States Marines invaded Boston Common to show off high-tech military hardware. While crowds were noticeably impressed with the heavy machinery such as the Osprey helicopter and Abrams tank, the most cutting-edge military equipment came in much smaller packages. The Marine Forces System Command is a branch dedicated to integrating new technology into the Marines' inventory. Consumer electronics actually play a very big role in the Marine's technological arsenal. ***tinyurl.com/3892foj***

TRUE FACT

33% of men TV/Web multitask, compared to about 25% of women.

SOURCE: IN-STAT AND CAPGEMINI

If it's good enough for Google...

GETTING A nod (and a wad of cash) from Google has to rank pretty high on the success meter for start-ups. So far 10 lucky companies have been backed by Google's newly minted investment fund, Google Ventures. Among these first 10 are Adimab, which is building a platform for discovering therapeutic antibodies more quickly than traditional methods; payment services provider Corduro; English Central, which makes language learning software that uses movie clips and other mainstream sources

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good

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IF YOU were going to start a cloud computing company, wouldn't cloud.com be the perfect domain name? With all the hype surrounding cloud computing, it may be surprising that www.cloud.com wasn't gobbled up by a major corporation such as IBM, Amazon or Microsoft. After all, www.cloudcomputing.com is owned by Dell. Cloud.com is simpler and easier to type, though, and in recent months there was speculation the domain name could fetch six figures, perhaps even more than $250,000.

Who bought it? A company called VMOps, which launched the new Cloud.com brand last week.

bad

Now you can't even trust the Treasury Dept.'s Web site?

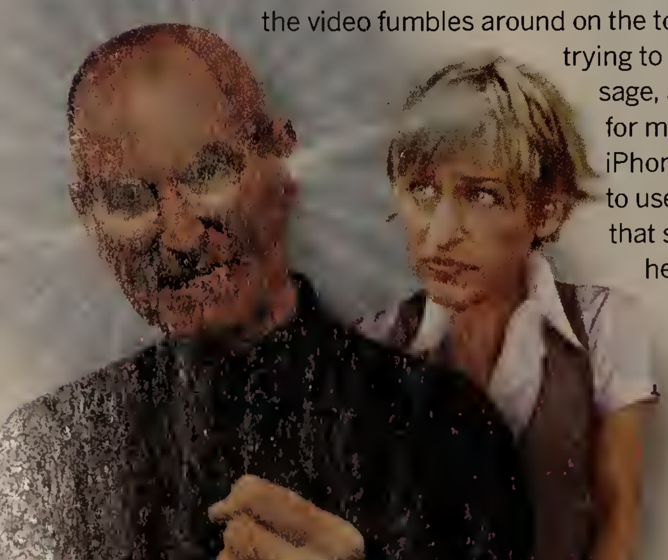
THREE WEB sites belonging to the U.S. Department of the Treasury were hacked last week to attack visitors with malicious software, security vendor AVG says.

AVG researcher Roger Thompson discovered the issue on three Web domains associated with the home page of the U.S. Bureau of Engraving and Printing. According to Thompson, hackers had added a small snippet of virtually undetectable iframe HTML code that redirected visitors to a Web site in the Ukraine that then launched a variety of Web-based attacks based on a commercially available attack-kit called the Eleonore Exploit pack.

ugly

Apple isn't amused

TALK SHOW host/comic Ellen Degeneres has apologized to Apple after the company let it be known it wasn't laughing at an iPhone spoof she ran on her program last week. "I thought it was funny, a bunch of people thought it was funny," she said. "You know who didn't think it was funny? The people at Apple didn't think it was so funny." Degeneres, who in the video fumbles around on the touchscreen trying to send a message, apologized for making the iPhone look hard to use and noted that she loves her iPad, iPod and even iHop.



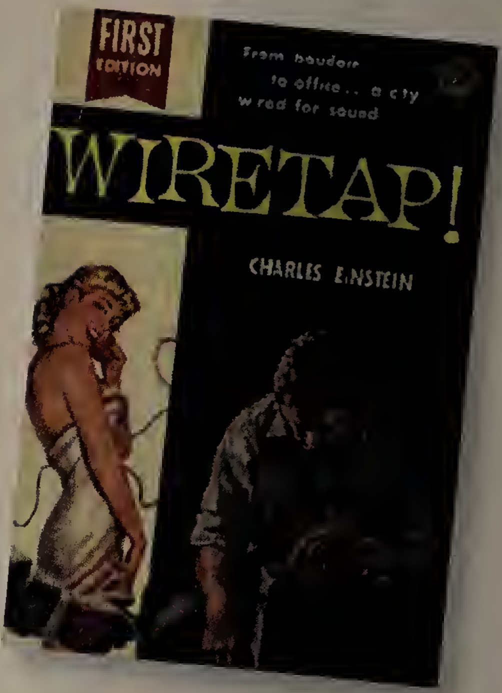
to teach English; and Recorded Future, which uses data analytics technology to analyze the past and predict the future. ***tinyurl.com/2wcylgs***

IBM buys Cast Iron

IBM IS beefing up its data-integration portfolio with the acquisition of Cast Iron Systems, which focuses on cloud computing connections. Cast Iron will help IBM customers build hybrid clouds that combine on-premise applications, public cloud platforms like Amazon Web Services, and private cloud deployments. Big Blue's software division has made more than 55 acquisitions since 2003. This deal makes sense since Cast Iron has already built out integrations for many of the top SaaS products, such as Salesforce.com and Oracle CRM on Demand, said Redmonk analyst Michael Coté. "For a company like IBM, if there's someone who's already solved that problem, it's an easier thing to buy [them] than do it on your own." ***tinyurl.com/38h8lpu***

Are you due $2.90 from AT&T?

IF YOU signed up for AT&T DSL service after March 31, 1994, you might be eligible for a partial refund. Without admitting any wrongdoing, AT&T just settled a class-action lawsuit that claimed it delivered data rates slower than promised. If AT&T's records indicate it configured the downstream speed of a user's DSL service at a slower rate than promised, the user is eligible for $2.90 per month that the service was too slow. Go get yourself a cup of Starbucks joe. Oh, better make that Dunkin Donuts. ***tinyurl.com/334v28t***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WIRETAP!
CHARLES EINSTEIN

Lawmakers mull changes to wiretapping law

MICROSOFT AND the Center for Democracy and Technology are calling for a revamp of the 1986 Electronic Communications Privacy Act. There's widespread confusion over the law, James Dempsey, CDT's vice president for public policy, told a U.S. House of Representatives subcommittee in early May. The Department of Justice says federal agents do not need a court-issued warrant to request the contents of e-mail from vendors that store the e-mail, even though agents would need a warrant to see a document stored on a laptop or in a file cabinet, Dempsey says. And many telecom and Internet service providers don't understand the rules about what customer communications they are required to turn over, added Albert Gidari Jr., a partner with the Perkins Coie law firm in Seattle. ***tinyurl.com/3ah3267***

$250k power play

PUT YOUR thinking caps on. A California utility is offering a pair of $250,000 rewards to customers who can show off a new technology or technique for saving energy. Silicon Valley Power will pay grants to customers who implement exceptionally creative uses of energy technology that aren't yet commercially viable or widely accepted, yet show potential for successful market growth. ***.tinyurl.com/2vcjnqv***

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Google Apps vs. Microsoft Office

Google may pose strongest long-term threat to Microsoft's dominance

BY JON BRODKIN

GOOGLE APPS or Microsoft Office? That is the question on the minds of many CIOs.

Microsoft has long dominated the e-mail, collaboration and office tools market, and its customer list dwarfs that of Google and all other competitors. But despite the presence of well-established alternatives such as OpenOffice and IBM's Lotus Notes, some industry analysts believe Google may pose the strongest long-term threat to Microsoft's office dominance.

"Google is still a wannabe, but they're Google so this is a very strong challenger," says Laura DiDio, lead analyst with Information Technology Intelligence Corp (ITIC).

Why should a business choose Google over Microsoft? Google is inexpensive, at $50 per user per year. Employees are often familiar with Gmail, so user training shouldn't be too burdensome. Outsourcing IT functions to Google lets businesses reduce internal IT expenditures and time spent maintaining servers and applications. With Google, businesses get the basic productivity tools of e-mail, calendaring, and document creation and editing, as well as a Web site builder, private video sharing and other functions.

Yet even Google has a hard time arguing that its own office tools are just as good as Microsoft's. And customers and analysts agree that Google's support is not on the same level as Microsoft's, which has more experience dealing with corporate customers.

But Google's momentum, and the emergence of cloud computing as a viable alternative to in-house IT systems, has clearly caused Microsoft to change the way it approaches the office market. Microsoft offers its own online services now, and is forced to give better pricing to customers who bring up the name of Google as a negotiation tactic.

Rexel, an electrical distributor in France, recently chose to deploy Microsoft Exchange Online instead of Google Apps and was able to get pricing that was nearly identical to Google's $50 per user per year, says CIO Olivier Baldassari.

"We were fortunate in the process to have this competition playing in our favor," Baldassari says. "Microsoft has been pushed by Google. And Google keeps pushing Microsoft. It is forcing Microsoft to adjust its strategy, and Microsoft has been reacting great. It's a good process and everybody's benefiting."

Microsoft Office list prices from $150 to $680 for the various home, student, small business and professional editions. Like any IT product, negotiations with large businesses include heavy discounts, particularly when the customer appears to be considering other options.

"In terms of Office [competition], we don't run into Google a lot," says Microsoft's Tom Rizzo, director of online services. "If we run into competitors, such as OpenOffice or Google, we find it as a negotiating tactic for the customer."

Rizzo likes to point out that Google's $50 per user per year price is not exactly all-inclusive. Google's Postini spam and virus protection comes with the Apps enterprise edition, but message archiving is an extra fee of $13 or $33 per user per year, depending on the length of archiving required. Additionally, third-party vendors have emerged to plug the gaps in Google at extra cost. However, many of the add-on tools available on the Google Apps Marketplace are free.

Key components of Google's office suite

Gmail for business, featuring 25GB of storage, e-mail security and a 99.9% uptime service-level agreement.

Google Calendar, for scheduling, shared online calendars and mobile calendar sync.

Google Docs, for creating documents, spreadsheets, drawings and presentations, and working online without attachments.

Google Groups, for user-created groups with mailing lists, content sharing and searchable archives.

Google Sites, for creating Web pages without code, useful for intranets and team-managed sites.

Google Video, for private video sharing, useful for corporate announcements and training.

Price, $50 per user per year

"The thought of Google Apps being totally free is a fantasy," DiDio says. "It might still be 50% to 75% less than Microsoft Office, if you're looking just at the up-front capex cost, but there are costs associated with it along the way."

Comparing support, market share

Customers must also accept a lower level of support than they would get from Microsoft, warns John Turner, network director at Brandeis University in Waltham, Mass. "The big joke is you have a problem, sure, go ahead and call Google. Where is that number again?" Turner says.

While Google's support is better than some people think, the company is not set up like a traditional enterprise vendor, Turner continues.

"They do provide us pretty decent support," Turner says. "For the most part they are very standoffish though. They don't want to hear about a deleted e-mail. They don't want to hear about a missing document. They're only there for major support issues, like when the service is down."

That's certainly one reason Microsoft still holds a giant lead in market share.

An IDC survey in July 2009 shows that nearly 97% of businesses were using Microsoft Office, and 77% were using only Microsoft Office.

About 4% of businesses use Google Apps as their primary e-mail and productivity platform, but the majority of these are small and midsize organizations, according to a separate survey by ITIC. This puts Google well behind the open source OpenOffice, which has 19% market share, ITIC has found.

But Google does have at least a small footprint that could help it expand. According to IDC, nearly 20% of businesses reported extensive use of Google Docs, mainly in addition to Microsoft Office rather than as a replacement. In October 2007, only 6% of businesses were using Google Docs extensively, so adoption is growing quickly.

Brandeis is implementing the full Google Apps suite this summer, in addition to its existing Microsoft Office deployment.

"The Google applications are pretty basic," Turner says. "They still don't really replicate that desktop experience."

Limited support for macros in spreadsheets, incomplete records management capabilities, the loss of formatting when importing Microsoft documents into Google,

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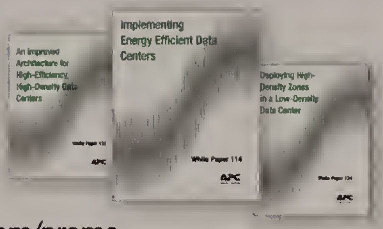
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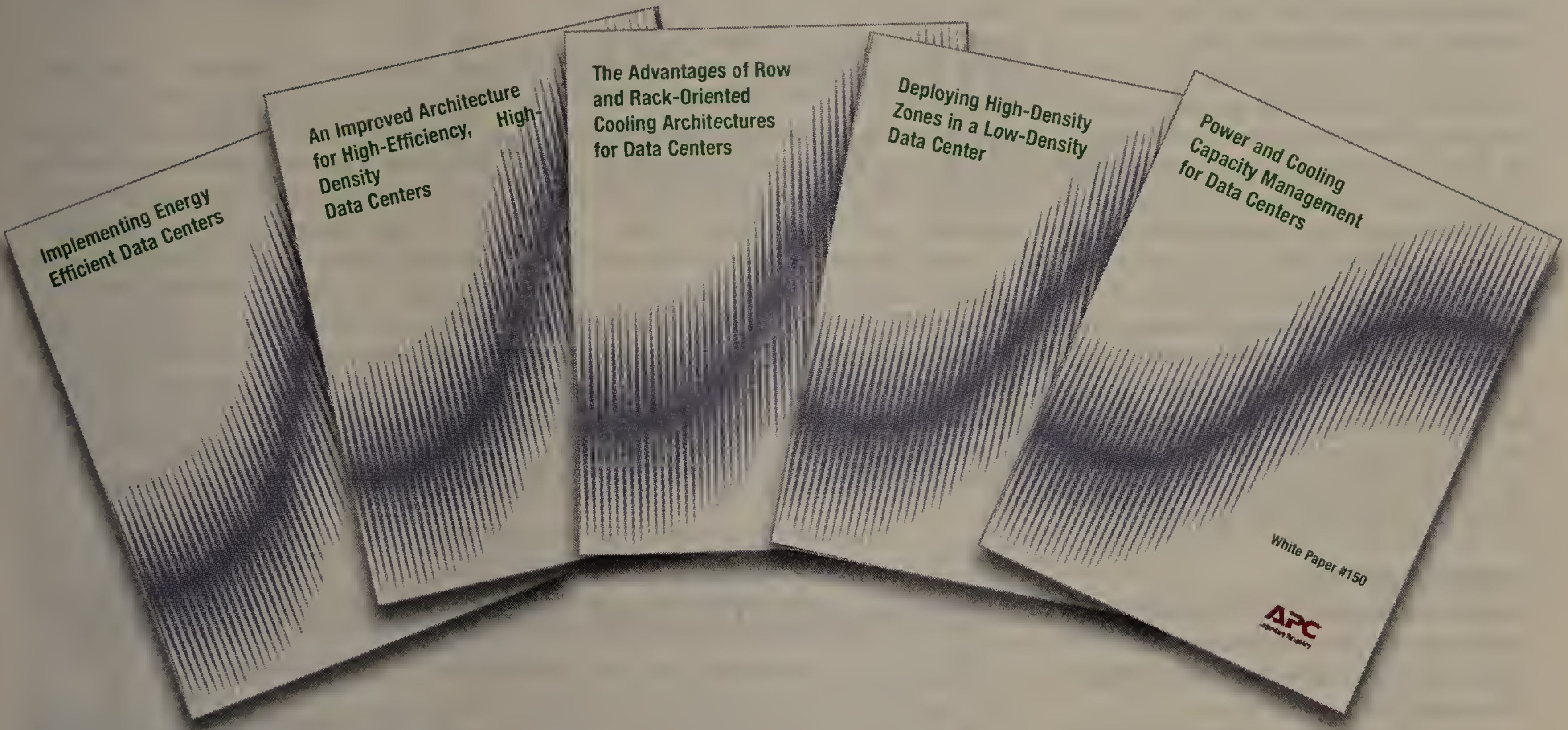

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and occasional downtime have all been mentioned by customers and analysts as shortcomings of the Google Apps suite.

The ubiquity of Windows and the popularity of Windows 7 also work against Google, as Microsoft's Office tools are likely to have better integration with Windows than Google Apps does. And since most businesses already use the desktop version of Microsoft Office, customers interested in cloud computing may find it easier to switch to the Web-based versions of Office than to the Google suite.

"Because of wide application support, integration and interoperability considerations, and technical service and support issues, it will be hard for many enterprises to do a wholesale conversion to OpenOffice or Google Apps within the next 24 months," DiDio says.

Dueling upgrades

Google recently updated the Docs application with some enterprise-class features, such as the ability to have 50 collaborators simultaneously edit a file.

Google Apps product manager Anil Sabharwal contends that few users will miss the extra features in Microsoft Office that aren't found in Google.

"There's a set of niche features that live in Microsoft Office that we acknowledge that we don't have in Google Docs, and we may never because they're so rarely used," he says.

When asked to identify those features, Sabharwal says, "I can't name them because I don't use them."

Sabharwal says Google has exceeded Microsoft capabilities in some areas, particularly with real-time collaboration and editing of online documents, in which all users see changes immediately and simultaneously. With Google, he notes, users can also work together without having to worry about what kind of operating systems are installed or licenses in use.

Google's main goals for the next year, he says, include increasing the features and number of Apps; maintaining simplicity and intuitiveness; improving IT administration tools including auditing, discovery and reporting; building secure connectors between the enterprise firewall and the Google cloud; and expanding accessibility across devices such as netbooks, smartphones, iPhones and iPads.

Microsoft isn't standing still, of course. The company has just released Office 2010 to manufacturing with more extensive Web-based versions of Word, Excel, PowerPoint and OneNote, and deeper integration between the Web-based and desktop versions of the software.

Microsoft Office Senior Product Manager Andrew Kisslo characterizes the Google features as rudimentary in comparison, joking that "the WordPad Team is very nervous" about the inclusion of a ruler in Google Docs.

Microsoft's online version of Exchange is close to a desktop experience, Baldassari says, and Microsoft distinguishes itself from Google when it comes to support, the main reason his company chose Microsoft over Google.

"Where Microsoft made the difference was really their approach to the enterprise world," he says. "The people we had in front of us clearly had more experience dealing with a corporation."

While Microsoft clearly has advantages, there is also frustration among CEOs over pricing and seemingly punitive licensing schemes, with perhaps enough discontent to spur widespread adoption of a less expensive alternative.

Microsoft is clearly worried — to an extent, says Forrester analyst Sheri McLeish.

"Microsoft is very worried in the sense that Google has a lot of recognition, momentum and is putting a lot of dollars and effort into their newer business ventures that aren't related to search," McLeish says. "They're walking a very fine line. While they're nervous and worried, they're not nervous and worried enough to dramatically reduce the cost of Office. They clearly have some insight into their customer base and the potential risk they face. They're delicately managing the pricing to protect their margins." ■

Los Angeles chooses Google Apps over Microsoft

30,000 users to get Gmail in L.A.'s deployment

Google is a long way from usurping Microsoft as the most popular maker of office software, but it scored a big win for its enterprise division when the city of Los Angeles committed to Google's cloud apps — a deal made even sweeter because $1.5 million of the project cost was indirectly financed by archrival Microsoft.

In the City of Los Angeles government, Google Apps is being deployed to alleviate three problems: a crushing budget deficit, IT staff shortage and widespread dissatisfaction with the current office software system.

With the city facing a $485 million projected budget deficit, the IT staff has been cut from about 800 people to 500 in the last three years. With fewer people it's getting harder to maintain in-house systems, such as the city's Novell GroupWise collaboration software, which has frustrated users with small mailbox sizes, says city CTO Randi Levin.

While an organization with more cash on hand might have chosen Microsoft Office, Levin says even if the price were the same she would have been worried about her department's ability to support an in-house mail system. Moreover, the city is in an earthquake zone but lacked a disaster-recovery system, and officials decided placing e-mail in Google's data centers would be a better way to guarantee uptime.

"We are not flush with a lot of cash these days," Levin says. "It took a lot of our resources and time to run an in-house e-mail system. We felt it was critical for the City of Los Angeles to have a disaster-recovery strategy in place."

L.A. ended up with a $7.25 million project to implement Google Apps, a price that includes fees paid to Google and for consulting work from CSC. That's a lot of money, particularly for Google Apps, which is mainly used by small and midsize businesses.

But L.A. is a large city government, with more than 40 departments and 30,000 users. City officials believe they will save more than $5 million over the life of their five-year contract, and that ROI could be $20 million counting increased productivity. Coincidentally, $1.5 million of the project cost will be paid indirectly by Microsoft, which had to give Los Angeles money as part of a settlement for a class-action lawsuit that alleged Microsoft overcharged for software.

Google Apps, including Gmail, Google Docs and Google Calendar, have been rolled out to 3,700 users so far. Levin expects to be fully implemented by the end of June, with 100% of users on Gmail, and about 80% using

▶ *See* **Google,** *page 18*

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Computing resources can live anywhere, from a home office to a coffee shop hotspot to remote field locations. Decentralized compute resources put the responsibility for security more on end users than IT—and that's a problem. According to the Intel/Network World poll, nearly half (48%) of all respondents say their biggest security headache is getting everyone to buy in to established security practices.

But what human nature resists, IT can supplement by buying PCs with Intel Core vPro processors. Following are some specific PC security manageability issues identified in the survey, along with an examination of how smart security features built in to Intel Core vPro processors help fill the gap.

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[1] "The Cost of a Lost Laptop," by Dr. Larry Ponemon, April 22, 2009. The Ponemon Institute LLC *http://communities.intel.com/servlet/JiveServlet/download/3076-3-1994/Cost of a Lost Laptop White Paper Final 2.pdf*. Based on compiled data on 138 instances of laptop loss or theft within a 12-month period.

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Microsoft woos developers with IE9 preview

Microsoft sharing details around its upcoming Internet Explorer 9 release

BY DENISE DUBIE

MICROSOFT LAST week unveiled the second platform preview of its Internet Explorer 9 browser, which isn't due to be released to market for another year. Industry watchers expect the iterative versions will help Microsoft keep developers interested in its technology as the browser market shares become ever more fragmented.

Microsoft made available its IE9 Platform Preview 2 download last week, touting speedier performance and better support for standards. The company reported that according to WebKit.org's SunSpider benchmark test, IE9 had gotten faster, with improved results from the first platform preview to the second by 117 milliseconds. Microsoft is also working on interoperability in its latest browser revision.

"We're submitting 79 new tests [bringing our total to 183 tests] to ensure true interoperability and achieve the goal of developers writing the same markup. You've heard it before: We love HTML5 so much we actually want it to work," a company spokesperson wrote in a press statement.

Microsoft representatives in March unveiled the first preview platform at MIX 10, saying it would continue to deliver preview versions every eight weeks. This version comes at about seven weeks following the first, proving Microsoft is working to keep developers interested in the platform, according the Sheri McLeish, an analyst with Forrester Research.

"It is an iterative process and the product won't be out for another year, give or take. But if Microsoft is able to have it out in public and have developers banging around on it, that generates and maintains interest," she says.

The company could be ramping up the release date considering a highly competitive browser market, which for Microsoft is relatively new. Recent data from NetMarketshare shows that for April 2010 Microsoft IE garnered nearly 60% of the Web browser market, with Firefox claiming close to 25%. Other competitors such as Google's Chrome and Apple's Safari accounted for nearly 7% and about 5% of the market, respectively. While Microsoft remains in the lead, it has been losing share points and there continues to be "strong competition on the horizon," McLeish says.

"The impact of Google, the menu choice in Europe, and the rise of Apple — these things are all making it increasingly difficult for Microsoft to maintain these very wide margins of market share," McLeish says. "If you roll up the many versions of IE [IE6, IE7 and IE8] currently on the market together, Microsoft is still dominant. But Microsoft's interest is to get IE9 out there and put all these other versions to bed."

According to Forrester data, the combined versions of IE on the market today have more than 70% market share, with two versions of Firefox holding 20% of the market. Chrome tapped out at about 7%, with Safari not even garnering 1%. The monthly browser usage data was based on more than 90,000 client visits to Forrester.com. Another survey of 115 collaboration and productivity decision makers showed that 60% felt IE was the best at ensuring "functionality of business critical enterprise apps."

"With these releases, Microsoft gets developers trying out their products, which ultimately helps them put a better product on the market," McLeish says. "A company as big as Microsoft does have the ability to get a million people hacking away on these applications and it serves them well." ■

Sticking with IE

More than 40% of 111 collaboration and productivity decision-makers polled by Forrester Research said they are "not at all interested" in leaving Microsoft Internet Explorer for a competitive browser. Another 20% said they have little motivation to move off IE.

▶ **Google,** *from page 16*

Google's other office products. Google's non-email tools are not quite rich enough yet to completely replace Microsoft Excel and other types of in-house software.

"Most of the users are very satisfied [with Google], and they're liking a lot of the new functionality we're getting that we didn't have before," Levin says.

Workers have increased mobility, with access to e-mail and office tools on their mobile phones, Levin says. Workers also have greater ability to edit shared documents, and video chat is allowing some people to hold virtual meetings, rather than driving to City Hall.

Some office workers are still using Microsoft Excel instead of Google Docs, partly because Google doesn't support macros. L.A. also still uses Microsoft Access, Visio, and to a limited extent SharePoint, but for most city employees the basic functionality of Google Apps is enough. Levin and her team used Google spreadsheets to create their budget this year.

"It was wonderful to all be working on the same document at the same time," Levin says.

Not surprisingly, security was the biggest concern about moving e-mail and office applications over to Google's data centers, particularly as an early adopter. "There were not a lot of organizations to look to that had done this already," Levin says.

A city councilman and police union questioned the plan, saying they were worried about the risk of disclosing sensitive data. But the City Council eventually approved use of Google Apps by unanimous vote.

L.A. officials were convinced by Google's security credentials, which includes SAS 70 certification, as well as plans to build a government cloud network tailored to the specific requirements of public agencies.

L.A. needed its data stored only within the continental United States to meet regulatory demands, and Google was able to guarantee that, Levin says. Just as important are the failover capabilities built into Google's data centers, which will help L.A. meet its uptime and disaster recovery goals.

"The way Google works, even in the consumer marketplace, it automatically will fail over to another site," Levin says. "It's seamless, transparent, and not located in Los Angeles."

— JON BRODKIN

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Avaya breathes new life into Nortel technology

Avaya officials committed to, upbeat about data business

BY JIM DUFFY AND TIM GREENE

Avaya CEO Kevin Kennedy says SIP will let users ultimately control voice, video and other network content.

PHOTO: ALEX DUNNE

THERE MIGHT be some kick left in the old girl yet.

Nortel's data networking business may have found some new life under new owner Avaya, which obtained the assets from its recent $900 million acquisition of Nortel's Enterprise Solutions group.

The business grew 30% in the company's second quarter while its government business grew 15%, indications that momentum has returned following Nortel's bankruptcy. Indeed, at last year's Interop conference, Nortel enterprise chief Joel Hackney said customers had "hit the pause button" while Nortel sorted through its bankruptcy restructuring. But things are now looking up after the Avaya purchase and the company plans to ride the wave.

"Avaya is committed to the [Nortel] data business," said Hackney, now an Avaya senior vice president and president of the company's Government Solutions and Data Business, during an interview at the recent Interop conference in Las Vegas.

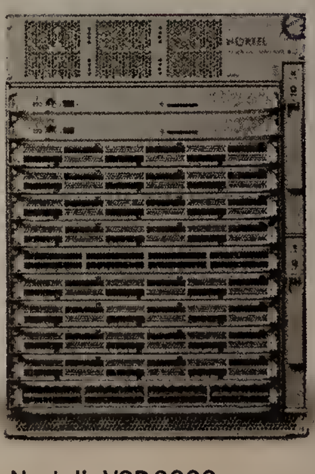
With that, Hackney gave a high-level overview of the raft of products Avaya unveiled this week, including the next-generation Ethernet Routing Switch 8800, the Advanced Gateway 2330 — which is designed to take on Cisco's ISR branch routers — and the Wireless LAN 8100 controller for 802.11n deployments.

"You'll hear again from us in the fall," Hackney promised, adding that his focus will be on networking. "We're not trying to be a server or storage company," he said — a thinly veiled jab at competitors Cisco and HP.

Indeed, Nortel's data networking business may have found new life at Avaya even though some industry pundits suggested Avaya would be better off divesting those operations.

"They're not in a position to grow much but they have a runway for business," says Jon Oltsik, a principal analyst at Enterprise Strategy Group. "There's a buying cycle they can capitalize on. And they can still find niches in their strong verticals, like healthcare, education and government."

Challenges for the business include retaining customer loyalty, especially during network upgrade cycles when users are likely to consider alternatives; and the perception that, with stagnant market share and the Nortel bankruptcy legacy, Avaya's data networking group may not going forward.



Nortel's VSP 9000

"They not only need to invest in product and channel development, but in getting the word out more," Oltsik says.

At Nortel the enterprise switching and routing group — mostly obtained from 1998's acquisition of Bay Networks — always felt "underneath" the carrier business, Hackney said.

But enterprise is the sole focus at Avaya and advances on the data networking side will continue, he said. Examples include the ability of the Advanced Gateway 2330 to go into Avaya's installed base as a Session Initiation Protocol (SIP) gateway from VoIP, yet attain full routing capabilities through an optional software upgrade.

This is the inverse of Cisco's ISR, which goes into branch offices first as a router, and then attains VoIP and other capabilities through upgrades, Hackney said. Avaya believes SIP will remain the driver of innovation in unified communications for the next decade, putting it on par with TCP/IP as a networking game changer.

Avaya CEO Kevin Kennedy told an overflow crowd at his Interop keynote address that the signaling technology will enable applications and endpoints to control the delivery of content via voice, video, data, instant messaging and even context.

Another is the eventual ability of the 8100 WLAN controller to bifurcate its forwarding and control plane capabilities to handle scaling of 802.11n access points. As the number of 802.11n access points grow, the controller can pass off packet forwarding to Avaya's 8800 core, and 4500 and 5500 edge switches while retaining control intelligence for the 802.11n traffic.

This lets the customer avoid buying more controllers as the WLAN scales, Avaya officials said. This capability for the switches and WLAN controller will emerge in the second half of 2011, they said.

In about two years, the control capability will be offered as a software CD for servers, the Avaya officials said.

Meanwhile, the VSP 9000 data center core switch Nortel unveiled at last year's Interop is in controlled release with a handful of large customers who are testing the switch, Hackney said. It will be generally available in the second half of this year, he said.

Kennedy said the four goals of his company are to support seven times the resiliency of its competitors, 20 times better performance, cut total cost of ownership in half and lower energy consumption by 40%. ■

Forensic tool will advance data recovery

Data recovery for images will be applied to other file types

BY TIM GREENE

NEW COMPUTER forensic tools will make it possible to recover more data from corrupted hard drives so long as the missing files haven't been overwritten.

Tools designed to harvest images from disks even after they have been deleted from the file system can be adapted to seek other file formats including Word documents, says Nasir Memon, a professor at the Polytechnic Institute of New York University (NYU).

In research that he hasn't yet published, Memon says he will show that techniques used to cull images can be adapted to find text files, a capability that would be attractive to businesses trying to salvage data that may be fragmented and dispersed across a corrupted drive.

The text tool will examine fragmented chunks of files that may be distributed across a disk and analyze their content to see which ones likely go together. "It looks at global differences, for example, Twain vs. Shakespeare. Syntax helps eliminate false positives," Memon says.

The technology could also be applied by investigators seeking to find electronic evidence in legal cases, he says. For instance, it might be able to turn up a higher percentage of e-mails that had been deleted from accounts but that would be admissible as legal evidence if they could be found.

"We may be overlooking relevant information because we don't have the right tools for looking at it," he says.

As hard drives fill up and individual files are fragmented and distributed to available slots on the drives, they become difficult to compile, especially if they have been deleted, pulling references to where the fragments are located from the system file, he says. Without that index, piecing the fragments together can become an impossibly complex task.

The tool is based on a recovery method known as SmartCarving that was discovered at NYU and is commercially sold by vendor DigitalAssembly, which was founded by former students of Memon.

Reclaims up to 15% of digital images

SmartCarving can reclaim 10% to 15% of digital images that conventional forensic tools miss when trying to find files that have been deleted from the file registry, he says.

Traditional file recovery seeks a known header and footer for a file and gathers all the related data blocks in between. If the data blocks making up the file are fragmented, traditional tools crash when they hit a fragment of a different format that might be sandwiched between pieces of the file being sought, Memon says.

SmartCarving images involves drawing together data blocks from a single image that are arranged consecutively on a drive and linking them to other groups of data blocks based on whether they seem to blend using criteria such as pixel density and dimensions of the image.

In this way, it becomes possible to recover partial images when pieces are missing and to recover images when headers are missing, Memon says. "You look at what can be decoded and pick the best," he says.

The actual sorting is done by algorithms that graph data segments to see which are most like another based on preset criteria. The closer fragments fall on the graph, the better the fit they are considered to have.

Using the technique on photos can reassemble photos even if some of the image data is missing, resulting in a picture that has a band missing from it. The method can create approximate headers for image files as well, which results in gathering and reassembling enough pieces to recreate a version of the image that might not be as sharp as the original, Memon says.

New research adapts this technique to other file formats such as .doc files. It looks at the content in file fragments and classifies it based on syntactical similarities. This is akin to sorting a box of jigsaw puzzle pieces that contains the pieces for many puzzles so that all the pieces from each puzzle are put in separate boxes, he says. Each puzzle can then be assembled based on the shapes of the pieces and the image fragment printed on them. ■

[TOUGH QUESTION #9]

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RISKANDREWARD | BY ANDREAS ANTONOPOULOS

Real security breaches take time

THE HACKER typed furiously, cracking the encryption manually. Then suddenly she had an idea: "CTRL+ALT+F2+x", she typed, then shouted "We're in! We have complete control of the mainframe".

In the movies, security breaches are binary affairs. One second the attacker is faced with insurmountable NSA grade encryption, the next they have complete control of everything. Of course, in real life, security breaches are more boring. A real-life security breach, whether by an external attacker or a disgruntled insider unfolds gradually, over weeks, months or even years.

The difference between fictional attacks and real attacks is important because the way we understand an attack influences how we spend money to defend against it. For instantaneous, winner-takes-all attacks, we will probably focus all our money on security controls and enforcement and expect that we must succeed 100% of the time or lose everything. In real life, we apply defense-in-depth and invest as much in monitoring and incident response as we do in front-end controls. We expect that breaches will happen, but we hope to limit their scope and impact.

An unfolding security breach is a bit like someone attempting to traverse an obstacle course. Our job is to lay out obstacles and traps. The aim is twofold: obstacles are intended to slow the attacker down, but also to divert the attacker to less lucrative or more risky attacks where they are more likely to fail and be noticed. If you look at security breaches as an obstacle course, you arrive at two important insights. Firstly, there is no way to guarantee that no one can traverse any part of the obstacle course — it's a matter of when, not if. Secondly, you should put as much effort into stopping an attack-in-progress as preventing one from happening in the first place.

We must accept that attackers will be able to overcome security controls and we must also understand that the attack will unfold over time, gradually getting more and more dangerous to our business. The first compromise may be minor: breaking into a single user account, discovering an internal IP address, stealing a list of employee phone numbers. An attacker will build upon each compromise, using it to expand his reach and control of our infrastructure. At each step there are opportunities for us to discover the breach, if only we are watching. At each step, the attacker faces increased risk of discovery. If we have good defense-in-depth then we've removed the easy and low-risk attack vectors and left mostly risky and difficult ones.

A secure company is not one that cannot be breached. Those do not exist. A secure company is one that can minimize, contain and mitigate the impact of breaches. A big part of "being secure" — perhaps the biggest part — is what you do to deal with a breach in progress, recognizing that you can't stop them all. To that goal, companies should invest more in logging, monitoring, auditing, incident response and forensics. ■

Antonopoulos is a senior vice president and founding partner at Nemertes Research, an independent technology research firm. He can be reached at andreas@nemertes.com.

EYEONTHECARRIERS | BY JOHNA TILL JOHNSON

IT is becoming ET (Enterprise Technology)

A LONG time ago in a galaxy far, far away, IT as we know it didn't exist. I'm talking of course about the 1980s, when what we call IT was generally called MIS (management of information services). MIS was about automating back-office functions such as accounting and payroll. It was mostly based on mainframes, and MIS professionals were largely programmers, whose unique skill was the ability to design effectively at scale — that is, write multi-thousand-line software programs. And the primary users of MIS were discrete business groups, not rank-and-file employees.

Enter IT. In the 1980s and early 1990s, two disruptive technologies emerged: the PC and the network. The benefit of these technologies was the ability to exchange and distribute information in real time, and the user base expanded from payroll and accounting to pretty much any office employee. And the key discipline shifted from the ability to write gigantic, well-organized programs to being able to interconnect disparate and heterogeneous systems.

The result? MIS went away, and IT took its place. Although companies still employ application developers, many of the large, scalable applications are now delivered by third-party providers such as SAP and Oracle — and increasingly, in the form of software-as-a-service.

Get ready, folks: Things are about to change yet again. IT is morphing into "enterprise technology." And just as IT represented the expansion of technology from the old "glass house" of MIS to a broader group of office workers, ET represents an expansion of technology beyond office workers to every employee — and more importantly, every device and system — in an organization, even those who don't historically work with computers and phones.

The core benefit of ET is the ability to correlate vast amounts of information in real time — and to actively control the physical world based on that information. Because ET is connected with the physical world, its core architecture can best be described as "embedded."

An indicator: AT&T recently shifted its accounting to specifically include revenue generated from "connected devices" (machine-to-machine, including Amazon Kindles and healthcare monitors).

As with the shift from MIS to IT, the shift from IT to ET is disruptive. The old skills — in this case, the ability to interconnect heterogeneous devices and systems — are becoming less strategic, just as the ability to write gigantic software packages became less important during the shift from MIS to IT. Instead, the emphasis is shifting to technologies that extend and integrate with the physical world. Some characteristics of these enterprise technologies:

- They involve some element of integration with the physical world. Examples: sensor networks, display technologies, smart grids, wireless monitoring devices.
- They are real-time.
- They involve large to very large amounts of data (example: business intelligence).
- They can often be used to control — not just monitor — the physical environment (examples: power-control networks, telerobotics).
- They are intrinsic to an organization's business.

The fundamental challenge facing today's IT leaders, therefore, lies in embracing and making the most of both worlds: strategic ET and legacy (commoditizing) IT. Want to learn more? Stay tuned. ■

Johnson is president and senior founding partner at Nemertes Research, an independent technology research firm. She can be reached at johna@nemertes.com.

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IPv6 tunnel basics

Mechanisms aid IPv4-to-IPv6 transition for network operators

BY CAROLYN DUFFY MARSAN

MORE INTERNET traffic is expected to be carried via tunnels as the Internet infrastructure migrates from IPv4, the current version of the Internet protocol, to the long-anticipated upgrade known as IPv6.

IPv4 uses 32-bit addresses and can support 4.3 billion devices connected directly to the Internet. IPv6, on the other hand, uses 128-bit addresses and supports a virtually unlimited number of devices — 2 to the 128th power.

The regional Internet registries said in April 2010 that less than 8% of IPv4 addresses remain unallocated. The remaining IPv4 addresses are expected to run out in 2011 or 2012.

As of March 2010, only 1% of Internet traffic was based on IPv6, according to Geoff Huston, chief scientist at APNIC. He noted that 90% of IPv6 traffic was native, while 10% was using a tunneling mechanism to carry IPv6 traffic over IPv4 links.

Of the various tunneling mechanisms, the so-called 6to4 technique appears to be gaining in popularity, while the alternative Teredo is becoming less common, Huston says.

"The number of folks doing 6to4 as a percentage of IPv6 folks is increasingly rapidly," Huston told the audience at an Internet Society IPv6 panel in Anaheim, Calif. "The number of folks doing Teredo is really low. I'm not sure we need it."

Here are the basics about the most popular tunneling and encapsulation mechanisms that are available to help transition your network from IPv4 to IPv6.

6to4

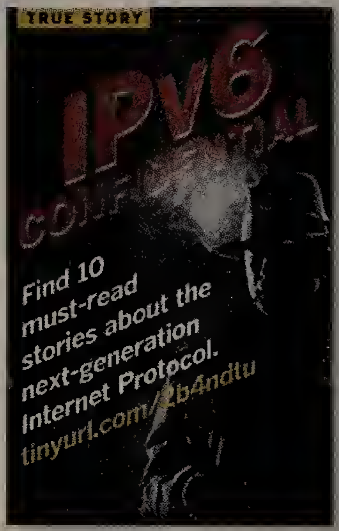
6to4 is a method of connecting IPv6 hosts or networks to each other over an IPv4 backbone. It doesn't require explicit tunnel setup, and instead uses relay routers to forward encapsulated IPv6 packets over IPv4 links. It uses unicast to create point-to-point links over the IPv4 backbone for transmission.

6to4 is the method of choice for users or networks that want to connect to the IPv6 Internet using an IPv4 connection. It allows these users to communicate with other 6to4 users as well as users of native IPv6 connections.

One benefit of 6to4 is that it doesn't require configured tunnels. It can be implemented in border routers without a great deal of router configuration.

Hurricane Electric, the most interconnected IPv6 network, operates a global 6to4 relay service and as a relay service for an alternative tunneling mechanism known as Teredo. Hurricane Electric says its IPv6 traffic doubled in 2009, thanks to the free IPv6 tunnel broker that it began providing in April 2009.

Jason Livingood, executive director of Internet Systems Engineering at Comcast, said in March 2010 that Comcast had seen a 500% increase in 6to4 traffic in the last 60 days.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6rd

6rd — for IPv6 Rapid Deployment on IPv4 Infrastructure — is a method of encapsulating IPv6 packets for transmission over IPv4 backbone networks. It was used by the French ISP Free to rapidly deploy IPv6 to its 1.5 million residential customers in 2007.

The 6rd approach requires customers to have home gateways/routers that can support 6rd and can do the encapsulation of IPv6 packets inside IPv4 and forward them across the Internet backbone. The ISP, in turn, operates 6rd gateways to handle the tunneled IPv6 traffic.

6rd is a modification of the 6to4 technique that allows ISPs to handle native IPv6 traffic headed toward their customers. The modifications allow ISPs to accept only tunneled IPv6 traffic that is headed toward their customers, and all of this traffic goes through 6rd gateways operated by the ISP.

6rd is one of the transition mechanisms that Comcast is testing as part of its ongoing public trial of IPv6.

Teredo

Teredo is a tunneling protocol that provides IPv6 connectivity to users that are behind network-address translation (NAT) devices that support only IPv4. Teredo encapsulates IPv6 packets inside IPv4 packets for transversal across these IPv4-based NAT devices and the IPv4 backbone.

One supporter of Teredo is Microsoft, which ships Vista and Windows 7 with Teredo enabled by default.

Hurricane Electric began operating a worldwide Teredo relay service in 2009 that has given a boost to this tunneling technique. Hurricane Electric enabled 14 Teredo relays in Seattle, Fremont, Calif., Los Angeles, Chicago, Dallas, Toronto, New York, Ashburn, Va., Miami, London, Paris, Amsterdam, Frankfurt and Hong Kong.

"Hurricane Electric's Teredo service significantly improved the IPv6 goodput for the average Internet end user over night," says Craig Labovitz, chief scientist of Arbor Networks. "In particular, Microsoft Windows users got a big boost."

ISATAP

ISATAP refers to the Intra-Site Automatic Tunnel Addressing Protocol, which can encapsulate and transmit IPv6 packets over IPv4 networks or IPv4 packets over IPv4 networks. It is targeted at IPv6 deployment in enterprise networks.

ISATAP provides automatic encapsulation by using a virtual IPv6 overlay on top of an IPv4 network using IPv4 routers. Recently, ISATAP was enhanced to allow automatic IPv4-in-IPv4 encapsulation, which may be necessary for the co-existence of IPv4 and IPv6 in enterprise networks.

Tunnel brokers

Several tunnel brokers have been developed along with a Tunnel Setup Protocol (TSP).

TSP allows IPv4 or IPv6 packets to be encapsulated and carried over IPv4, IPv6 or IPv4 NATs. TSP is used by the tunnel client to negotiate the tunnel with the tunnel broker, which can terminate the tunnel.

TSP sets up the tunnel parameters between a user and a server. It handles authentication, encapsulation, IP address assignment and DNS functionality. It creates static tunnels, rather than automated tunnels, which has some security advantages.

Security concerns

All of the popular IPv6 tunneling techniques for carrying IPv6 packets over IPv4 networks raise security concerns.

The problem with these tunneling mechanisms is that most networks have IPv6 traffic running over them that they can't see because it is disguised as IPv4 traffic. This exposes networks to IPv6-based attacks such as botnet command and control. Network operators need IPv6-aware firewalls, intrusion-detection systems and network management tools in order to have visibility into encapsulated IPv6 packets. ■

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CUSTOMER VIEWPOINT

Investing in Efficiency with Virtualization

Need to do more with less? Virtualize your infrastructure.

Peter Graves

CIO, INDEPENDENT BANK

Peter Graves is CIO of Independent Bank, an Ionia, Mich.-based financial institution with approximately $3 billion in assets and over 100 offices. Under his leadership, Independent Bank has used server, application, and desktop virtualization to build a radically streamlined infrastructure that's cheaper to run and easier to change. Here he shares his thoughts on improving IT efficiency.

Ben Kohn

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What are the benefits of simplifying an IT infrastructure?

Well, I wouldn't say companies like ours that embrace virtualization have simplified their infrastructures necessarily. In some ways, we've made it more complex. But from that complexity have come opportunities that enable us to do things that weren't possible before. For instance, we've shrunk our hardware profile, so we have fewer servers to maintain. We can add new applications quickly, so our flexibility to meet business needs is greater. We're locking down our network in ways that allow for tighter security. And all of that helps us reduce costs and increase efficiency. So even though the systems and the way things interrelate are arguably more complex now, we're able to more easily deliver functionality to our end users.

> "We used to spend maybe 15 to 20 percent of our time on new opportunities and business initiatives, just because that's all we could spare. Today, we're spending maybe 40 or 50 percent of our time on strategic issues."

How much emphasis should companies interested in streamlining IT place on being able to add or remove capacity on demand?

It's a big focus area for us. Ultimately, we'll be able to spin up new servers as needed based on the time of day, the number of people on the network, or the number of people using a particular application. Then we can idle that capacity when it's no longer required. It's a much more robust and dynamic model that will save us money, because we won't have to maintain excess resources.

Plus, as Ben Kohn, one of our senior architects here, likes to point out we'll be more being able to add and remove capacity will make us more agile. It takes most companies weeks to respond to rising capacity needs, during which their performance and service levels can suffer. Being able to add capacity on demand will give us an edge on our competition and with our customers.

How can organizations that centralize IT services remain responsive to the needs of remote users?

Centralizing our applications through virtualization has helped us focus our IT resources. We have over 100 branches. If we had to provide service on site, our staffing would have to be much greater than it currently is and we still wouldn't have time to provide the quality of service that we do today. We survey our end users and achieve a very high satisfaction rating, and we couldn't do that without the infrastructure we have now.

How does streamlining your infrastructure end up impacting the way network managers spend their time?

It allows them to spend a lot more time driving innovation instead of keeping the lights on at night. For us, that's translated into a competitive advantage over a lot of other financial institutions. We used to spend maybe 15 to 20 percent of our time on new opportunities and business initiatives, just because that's all we could spare. Today, we're spending maybe 40 or 50 percent of our time on strategic issues. That's been a huge improvement.

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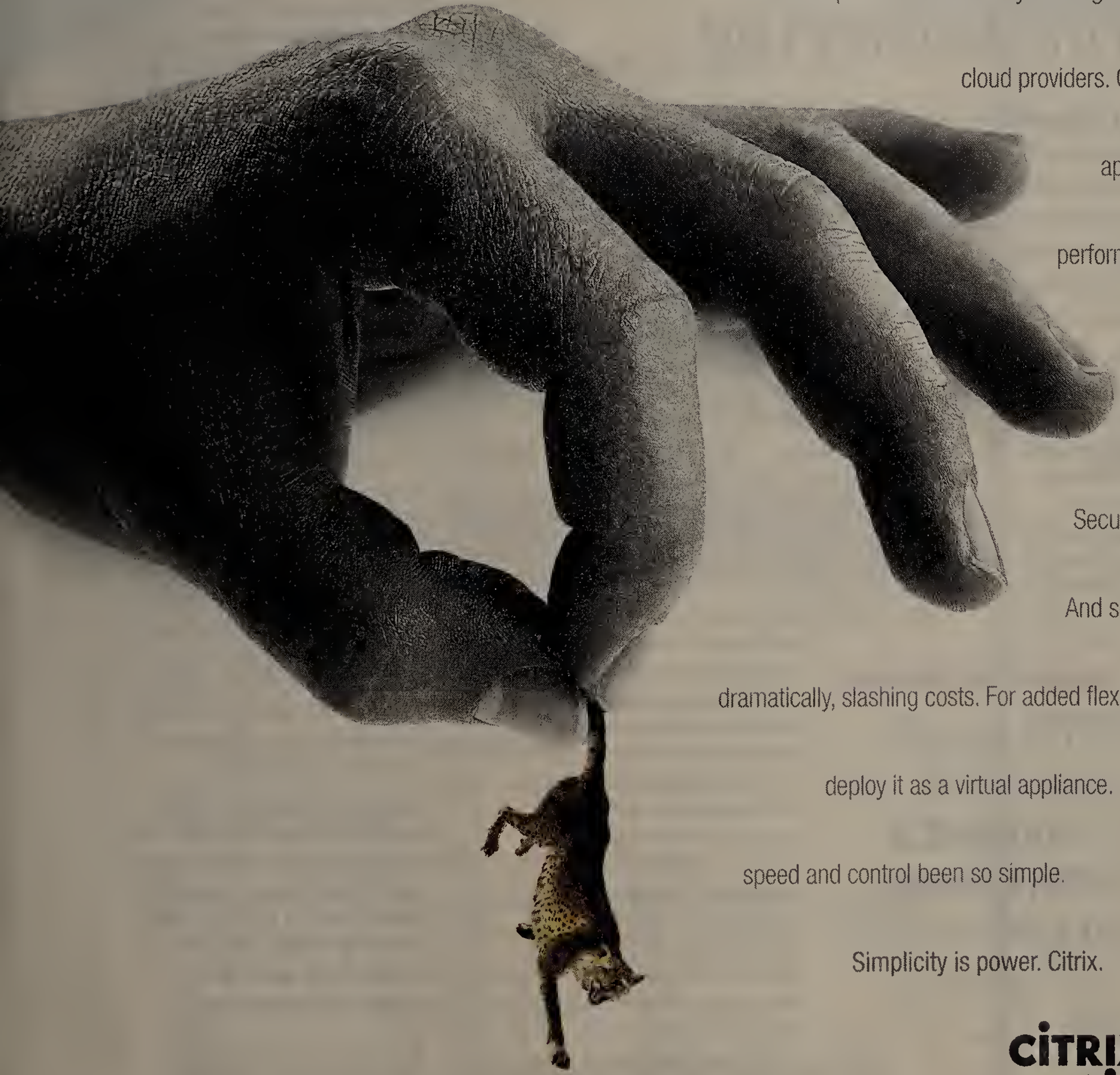

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TOOLS

Emergency Internet: Smartphone tethering

Mark Gibbs' Gearhead

In this column I recently recounted the problems I had getting DSL installed in my new house. But there was one part of the experience that actually proved instructive. In the period between moving in and getting back online I relied on a Motorola Droid smartphone on the Verizon network to keep track of e-mail and social media.

As I have noted, the Droid is a great device, one of the best phones I've ever tested and Verizon's service has really impressed me.

Anyway, at one point I needed to file this column and hadn't counted on the DSL installation delay. I had a sneaking suspicion, however, that someone somewhere must have created "tethering" software for Android.

Tethering software allows you to connect a smartphone to a PC via USB or Bluetooth and route IP packets to and from the phone's data services, effectively putting your PC online.

Unfortunately, I didn't have time to do the research so I did it the ugly way: I mounted the Droid's SD Card via USB, copied the file to the Droid's storage, renamed it from .doc to .jpg (the Gmail client only supports attaching image files), then unmounted the card, created a message, attached the fake image file, added a note about renaming the file to .doc, and hit "send". Worked like a charm; clugey, I admit, but it worked.

So, now that I had that out of the way I decided to see what tethering software might be available. After a little browsing in the Android Market (via the Droid) I discovered the most excellent PdaNet published by the oddly named June Fabrics Technology.

PdaNet is available for iPhone, Android, BlackBerry, Windows Mobile, PalmOS, Treo and Centro, and the Android version supports both USB tethering and Bluetooth Dial-Up Networking.

June Fabrics' explanation: "PdaNet does NOT require root access or hacking your phone's firmware in order to work. It is just a regular Android application that works on all Android phones as-is. Tethering is fast, secure and USB mode will also charge your phone at the same time. Your phone can either connect to 3G data, Wi-Fi, or even through VPN, and PdaNet will share the connection with your computer."

> Tethering software allows you to **connect a smartphone to a PC** via USB or Bluetooth.

I downloaded the Android software, which took a few seconds (got to love the Verizon service) and, once it was installed and I started PdaNet's USB Tether service, it asked if I wanted to download the PC software. I saved the PC software on the Droid's SD storage then mounted that on the PC using USB, copied the installer to the PC storage, and ran

▶ *See* **Gearhead,** *page 30*

IT asked and answered

Ron Nutter and **Steve Blass** tackle your tough tech questions at tinyurl.com/yg2o434

We're getting more and more training materials on DVD. With the amount of traveling our staff does, can we put them on an iPad ?

➔ The answer is yes. The thing you have to consider is how many DVDs you want to have on the iPad at the same time. Depending on the other applications you have installed and how many DVDs you want to support, you may need one of the larger models. Since the iPad is not field upgradeable (at least in this version), this has to be thought through. I'm testing a 32 Gig iPad in the labs now and can do just about anything I want so far, although I haven't worked with videos yet. From what I have read about the DVD conversion process, you can get five or more DVDs on the iPad. If you are just starting the evaluation of this project, I would recommend getting the larger 64GB model. Here are two programs for converting DVDs for iPad use: tinyurl.com/2ec4wc4, and tinyurl.com/2ahuq9z.

Topology question for CCNIA Home Lab: I currently have four 2520 routers, one 2514 router, two 2950 switches. I need to come up with a topology that will cover all requirements for the CCNA exam. Does anyone have some ideas?

➔ There are several sources that you can look at for possible lab layouts to use for your studies. The first one I would suggest is www.firewall.cx, which offers several layouts to consider. Or you can buy the Cisco Network Academy lab guides from Amazon.com.

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GADGETS

Tiny backup and ordinary object speakers

Keith Shaw's Cool Tools

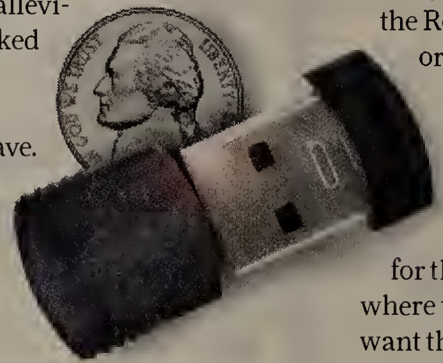
THE SCOOP

Echo ZE backup drive

by Lexar Media, prices range from $49.99 (8GB) to $139.99 (32GB).

▶ **What it is:** Lexar claims the Echo ZE is one of the smallest USB drives in the world, and it's hard to argue when you see the 20-by-15mm drive, which is no bigger than your thumbnail. Yet this tiny device provides up to 32GB of storage capacity, automatic backup and encryption on a PC or Macintosh when plugged into a USB port. The extremely small size means you can basically plug it in and forget that it's there.

▶ **Why it's cool:** The sheer size of the drive will amaze you, especially when you consider it can store up to 32GB of data. I like the "plug it in and forget it" aspect — automatic backup is a growing trend with personal storage that helps alleviate the "Have I backed up my computer lately?" syndrome that many users have. It's almost unfair to call it a drive; it's basically a USB connector with a cap.



Echo ZE has been coined one of the smallest USB drives.

▶ **Some caveats:** Because of its size, you may forget it so much that you lose it — I doubt this is meant to be carried around like a normal USB drive. While you could store additional files for transport, the best bet is to just use this as an automatic backup system, and for cases where you want to copy files from one system to another, just use a separate USB drive. Also, if you have a notebook with a limited number of USB ports, you may find it hard to justify using one of them with this port — I found it easier to use one of the additional ports on my USB hub.

▶ **Grade:** ★★★★½ (out of five).

THE SCOOP

Rock-IT portable vibration

by OrigAudio, about $50

▶ **What it is:** The Rock-IT connects to a portable music player or computer (anything that sends sound through the headphone jack), and through vibration sequences the music goes to a sticky pad that you can place anywhere. The object you stick the pad to becomes your speaker. The Rock-IT is powered through two AAA batteries, or via USB if you want to plug it into your PC.

▶ **Why it's cool:** Hearing is believing with the Rock-IT — it truly does transform ordinary objects into speakers. Half of the fun is going around your room trying to see which objects become better speakers (for example, paper cups and bowls were great, glass windows were not). The best case for the Rock-It are for outdoor situations where you want to share music but don't want the additional burden of carrying along another portable speaker system.

▶ **Some caveats:** After a while, the device seems to be like a parlor trick — once you get through the "Hey, watch this!" magic of the device, you're left with a speaker system made from a paper cup. Unless you are out and about a lot, you may only use this at home at parties, and for in-home speakers you have a lot of other speaker options.

▶ **Grade:** ★★★

Shaw can be reached at kshaw@nww.com.

TRUE FACT

Primary focus of IT investments for the next 12 months:

29%
Enable business process innovation

26%
Lower business operations costs

23%
Manage IT infrastructure more efficiently

SOURCE: CIO TECH PRIORITIES STUDY

▶ **Gearhead,** *from page 28*

it. I then unmounted the Droid storage, ran the PC application, enabled the USB service in the Droid application, and voila! My PC was online.

June Fabrics claims that the PdaNet software can operate at up to 20Mbps with zero latency. Of course, its performance will, in reality, be limited by the performance of whatever connectivity the phone is using to access the Internet. I found the performance to be excellent and services like Gmail ran pretty much as usual. A nice feature is that the PC client also includes an SMS interface so while PdaNet is in use you can text from your PC.

As an emergency connection, PdaNet is perfect. It can be used for free with the limitation that after 14 days it blocks secure Web sites. The price of the unlimited version is $23.95 and well worth the investment. I give PdaNet for Android a rating of 5 out of 5.

Gibbs is now untethered in Ventura, Calif. Link to gearhead@gibbs.com.

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While the hype continues to swirl around cloud computing,

the reality is that most companies are proceeding with caution. In a recent CXO Media survey, 48% of respondents said they were kicking the tires, but only 12% were actually using cloud services. And many companies are realizing that their networks might not be ready for the cloud.

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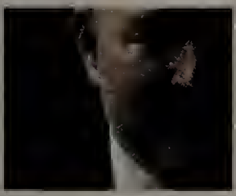

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online SLIDESHOW: Go online for slideshow of five things we love/hate about cloud management services **tinyurl.com/23f9r53**

Revving up for the cloud

Expert advice on how to approach an on-premises cloud, from take off to landing

~ BY BETH SCHULTZ ~

If you're nervous about running your business applications on a public cloud, many experts recommend that you take a spin around a private cloud first.

But building and managing a cloud within your data center is not just another infrastructure project, says Joe Tobolski, director of cloud computing at Accenture.

"A number of technology companies are portraying this as something you can go out and buy — sprinkle a little cloud-ulator powder on your data center and you have an internal cloud," he says. "That couldn't be further from the truth."

An internal, on-premise private cloud is what leading IT organizations have been working toward for years. It begins with data center consolidation, rationalization of OS, hardware and software platforms, and virtualization up and down the stack — servers, storage and network, Tobolski says.

Elasticity and pay-as-you-go pricing are guiding principles, which imply standardization, automation and commoditization of IT, he adds.

And it goes way beyond infrastructure and provisioning resources. "It's about the application build and the user's experience with IT, too," Tobolski says.

Despite all the hype, we're at a very early stage when it comes to internal clouds. According to Forrester Research, only 5% of large enterprises globally are even capable of running an internal cloud, with maybe half of those actually having one, says James Staten, principal analyst with the firm.

But if you're interested in exploring private cloud computing, here's what you need to know.

First steps

To build an on-premises cloud, you must have standardized —, and documented — procedures for operating, deploying and maintaining that cloud environment, Staten says.

Most enterprises are not nearly standardized enough, although companies moving down the ITIL path for IT service management are closer to this objective than others, he adds.

Standardized operating procedures that allow efficiency and consistency are critical for the next foundational layer, which is automation. "You have to be trusting of and a big-time user of automation technology," Staten says. "That's usually a big hurdle for most companies."

Automating deployment is probably the best place to start because that enables self-service capabilities. And for a private cloud, this isn't Amazon-style in which any developer can deploy virtual machines (VM) at will. "That's chaos in a corporation and completely unrealistic," Staten says.

Rather, for a private cloud, self-service means that an enterprise has established an automated workflow whereby resource requests go through an approval process.

Once approved, the cloud platform automatically deploys the specified environment. More often, private cloud self-service is about developers asking for "three VMs of this size, a storage volume of this size and this much bandwidth," Staten says. Self-service for users seeking resources from the internal company cloud would be "I need a SharePoint volume or a file share."

Thirdly, building an internal cloud means sharing resources — "and that usually knocks the rest of the companies off the list," he says.

This is not about technology. "It's organizational — marketing doesn't want to share servers with HR, and finance won't share with anybody. When you're of that mindset, it's hard to operate a cloud. Clouds are highly inefficient when resources aren't shared," Staten says.

Faced with that challenge, IT Director Marcos Athanasoulis has come up with a creative way to get participants comfortable with the idea of sharing resources on the Linux-based cloud infrastructure he oversees at Harvard Medical School (HMS) in Boston. It's a contributed hardware approach, he says.

At HMS, IT faces a bit of a unique challenge. It doesn't have the authority to tell a lab what technology to use. It has some constraints in place, but if a lab wants to deploy its own infrastructure, it can. So when HMS approached the cloud concept four years ago, it did so wanting "a model where we could have capacity available in a shared way that the school paid for and subsidized so that folks with small needs could come in and get what they needed to get their research done but also be attractive to those labs that would have wanted to build their own high-performance computing or cloud environments if

ILLUSTRATION: YUKO SHIMIZU

we didn't offer a suitable alternative."

With this approach, if a lab bought 100 nodes in the cloud, it got guaranteed access to that capacity. But if that capacity was idle, others' workloads could run on it.

"We told them — you own this hardware but if you let us integrate into the cloud, we'll manage it for you and keep it updated and patched. But if you don't like how this cloud is working, you can take it away." He adds, "That turned out to be a good selling point, and not once [in four years] has anybody left the cloud."

To support the contributed hardware approach, HMS uses Platform Computing's Platform LSF workload automation software, Athanasoulis says. "The tool gives us the ability to set up queues and suspend jobs that are on the contributed hardware nodes, so that the people who own the hardware get guaranteed access and that suspended jobs get restored."

Understand your services

If clouds are inefficient when resources aren't shared, they can be outright pointless if services aren't considered before all else. IBM, for example, begins every potential cloud engagement with an assessment of the different types of workloads and the risk, benefit and cost of moving each to different cloud models, says Fausto Bernardini, director IT strategy and architecture, cloud portfolio services, at IBM.

Whether a workload has affinity with a private, public or hybrid model depends on a number of attributes, including compliance and security, but also latency and interdependencies of components in applications.

Many enterprises think about building a private cloud from a product perspective before they consider services and service requirements — and that's the exact opposite of where to start, says Tom Bittman, vice president and distinguished analyst at Gartner.

"If you're really going to build a private cloud, you need to know what your services are, and what the [service-level agreements], costs and road maps are for each of those. This is really about understanding whether the services are going toward the cloud computing style or not," he says.

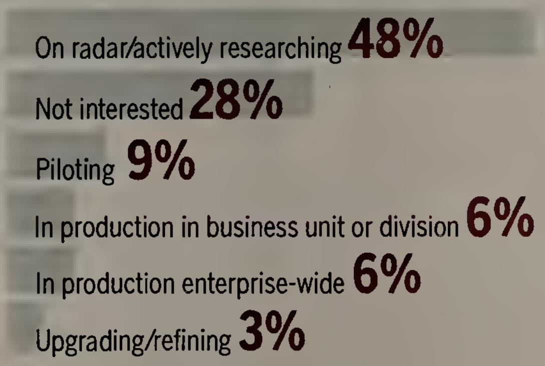
Common services with relatively static interfaces, even if your business is highly reliant on them, are those you should be considering for cloud-style computing, private or public, Bittman says. E-mail is one example.

"I may use it a lot, but it's not intertwined with the inner workings of my company. It's the kind of service moving in the direction of interface and independence. I want to make it as separate as possible, easy to use, available from self-service interface," Bittman says. "And if I've customized this type of service over time, I've got to undo that and make it as standard as possible."

Conversely, services that define a business and are constantly the focus of innovative initiatives are not cloud contenders, Bittman says. "The goal for these services is intimacy and integration, and they are never going to the cloud. They may use cloud functions at a low level, like for raw compute, but the interface to the company isn't going to be a cloud model."

Cloud caution

According to a CIO Magazine Technology Priorities Survey of more than 400 CIOs, only 12% say they have deployed cloud computing, while 48% are still researching the topic.



Only once you understand which services are right for the cloud and how long it might take you to get them to a public-readiness state will you be ready to build a business case and start to look at building a private cloud from a technology perspective, he says.

Toward that end, Gartner has defined four tiers of components for building a private cloud.

At the bottom sits the resource tier comprising infrastructure, platforms or software. Raw virtualization comes to mind immediately, but VMs aren't the only option — as long as you've got a mechanism for turning resources into a pool you're on the way, Bittman says. Rapid re-provisioning technology is another option, for example.

Above the resource pool sits the resource management tier. "This is where I manage that pool in an automated manner," Bittman says, noting that for VMware environments, this is about using VMware Distributed Resource Scheduler.

"These two levels are fairly mature," Bittman says. "You can find products for these available in the market, although there's not a lot of competition yet at the resource management tier."

Next comes the service management tier. "This is where there's more magic required," he says. "I need something that lets me do service governance, something that lets me convert pools of resources into service levels. In the end, I need to be able to present to the user some kind of service-level interface that says 'performance' or 'availability' and have this services management tier for delivering on that."

As you think about building your private cloud, understand that the gap between need and product availability is pretty big, Bittman says. "VMware, for example, does a really good job of allowing you to manage your virtualization pool, but it doesn't know anything about services. VMware's vCenter AppSpeed is one early attempt to get started on this," he adds.

"What we really need is a good service governor, and that doesn't exist yet," Bittman says.

Sitting atop it all is the access management tier, which is all about the user self-service interface. "It presents a service catalog, and gives users all the knobs to turn and lets you manage subscribers," Bittman says. "The interface has to be tied in some way to costing and chargeback, or at least metering — it ties to the service management tier at that level."

Chargeback is a particularly thorny challenge for private cloud builders, but one that they can't ignore for long. "It's tricky from a technology perspective — what do I charge based on? But also from political and cultural perspectives," Bittman says. "But frankly, if I'm going to move to cloud computing, I'm going to move to a chargeback model so that's going to be one of the barriers that needs to be broken anyways."

In the end, it's about the business

And while cloud-builders need to think in terms of elasticity, automation, self-service and chargeback, they shouldn't be too rigid about the distinctions, Bittman says. "We will see a lot of organizations doing pure cloud and a lot doing pure non-cloud, and a whole lot of stuff somewhere in the middle. What it all really comes down to is, 'Is there benefit?'"

Wentworth-Douglass Hospital, in Dover, N.H., for example, is building what it calls a private cloud using a vBlock system from Cisco, EMC and VMware. But it's doing so more with an eye toward abstraction of servers and not so much on the idea of self-provisioning or software-as-a-service (SaaS), says Scott Heffner, network operations manager for the hospital.

As HMS' Athanasoulis sums it up this way: "The reason why people use our cloud ... is because it provides compelling value to them — and that's not a bad place for IT to be. ■

Schultz is a longtime IT writer and editor in Chicago. She can be reached at bschultz5824@gmail.com.

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15 cloud companies to watch

These innovative vendors make the transition to cloud computing less daunting

~ BY BETH SCHULTZ ~

1. CloudShare

HEADQUARTERS: Menlo Park, Calif.
WHAT IT OFFERS: An on-demand service-as-a-software (SaaS) collaboration platform for running demonstrations, proofs-of-concept, technical evaluations and training.
HOW MUCH IT COSTS: All-inclusive pricing is on a per-seat, per-size model.
WHY WE'RE WATCHING IT: Having extra IT resources ready for the taking is one of the big promises of the cloud, but making that quick and easy — especially for individuals, workgroups or smaller IT shops — can be problematic. CloudShare, however, seems to have gotten that down to an art.

"This is a great solution if you need a lower entry point on technical expertise or time," says Steven Peltzman, CIO of New York's Museum of Modern Art. "This is drag and drop and you're off — lots easier to interface and get started with than with bigger, burlier cloud solutions."

For example, he says, "I could easily whip up a few servers to run a disaster-recovery exercise, prove what we need to prove and give the servers back."

2. Abiquo

HEADQUARTERS: Redwood City, Calif.
WHAT IT OFFERS: Abiquo Enterprise Edition, cloud management software
HOW MUCH IT COSTS: Community Edition: free download. Enterprise Edition: From $211 for 1 to 49 physical cores to $432 for 1,000 or more cores
WHY WE'RE WATCHING IT: Abiquo has tackled two problems plaguing just about any IT organization that operates a virtual infrastructure — how to manage it effectively and how to avoid vendor lock-in.

IT managers can use the software to create virtual data centers through which they can deploy bundled servers, storage and other physical resources, and applications from public or private virtual image libraries. The Abiquo cloud management software separates the task of managing those physical infrastructure pieces from the creation and management of applications. The software, running on a central server, auto-discovers machine resources, manages existing live virtual machines, and can capture and store "stateful" virtual machines.

What this all means for enterprise IT shops is the grand promise of vendor-neutral, interoperable management of virtual resource pools, inside the company or out in the cloud.

3. Boomi

HEADQUARTERS: Berwyn, Pa.
WHAT IT OFFERS: Boomi AtomSphere, a cloud integration platform for enterprises,

User View
CloudShare

"THIS IS DRAG AND DROP AND YOU'RE OFF
– LOTS EASIER TO INTERFACE AND GET STARTED WITH THAN WITH BIGGER, BURLIER CLOUD SOLUTIONS."

STEVEN PELTZMAN, CIO, NEW YORK'S MUSEUM OF MODERN ART

PHOTO: STEVEN VOTE

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JAMES RINALDI, CIO, *NASA Jet Propulsion Laboratory*

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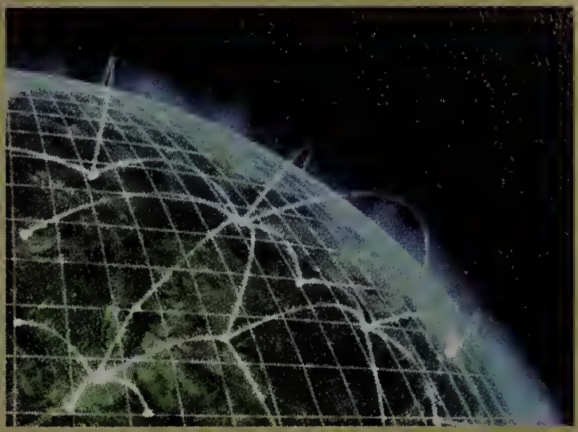

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systems integrators and SaaS players.
HOW MUCH IT COSTS: Monthly fees range from $495 for small/midsize businesses to $1,995 for complex, enterprise needs.
WHY WE'RE WATCHING IT: SaaS apps are increasingly becoming part of an enterprise's business solutions portfolio, and that gives rise to the thorny issue of integrating the new with the old. A company might, for example, complement a legacy ERP application with an online HR service for acquiring and managing talent. Sharing information between the two could prove highly beneficial – "'but what do you do when you've got the on-premises over here and the cloud over there?'" asks Mike West, a vice president with Saugatuck Technology, a strategic IT advisory firm.

"Integration is probably one of the most significant things companies want to do," West says. "'What are the concerns we hear about cloud solutions, year over year?' They're about integrated processes, data and workflows."

Boomi, West says, has the connectors to make that work. "It offers a powerful set of options for companies that want to manage cloud and on-premises applications or applications in multiple clouds."

4. Crosscheck Networks

HEADQUARTERS: Newton, Mass.
WHAT IT OFFERS: CloudPort, a cloud simulation product.
HOW MUCH IT COSTS: $4,999
WHY WE'RE WATCHING IT: Service-oriented architecture testing companies have begun rounding out their product lines with tools aimed at giving IT organizations more confidence as they plan for application migrations to the cloud. The product can also ease the infrastructure and cost burdens of building out lab environments.

With CloudPort, developers can profile and measure the impacts of moving to cloud platforms while modeling the risk and cost benefits, the company says. From a central console, the tool provides information about cloud providers such as performance metrics, geographic latency and service initiation times; outages and application error states; and security, capacity and interoperability. Plus, it offers the ability to run what-if modeling scenarios.

5. Egnyte

HEADQUARTERS: Mountain View, Calif.
WHAT IT OFFERS: Egnyte Local Cloud, a hybrid file server service combining local and cloud storage.
HOW MUCH IT COSTS: Pricing ranges from $9.99 to $49.99 monthly, plus an additional $4.99 to $19.99 monthly for optional local cloud storage.
WHY WE'RE WATCHING IT: Egnyte initially caught our eye in late 2008 for its cloud-based file storage service offering a new way to store and back up data, as well as share information. Egnyte has since upped the ante with the Local Cloud hybrid option. With this offering, users can tap into hosted files and store data when online and, when not connected to the 'Net, via a local cloud. When Internet connectivity is restored, the Egnyte Local Cloud synchronizes with the Egnyte Cloud File Server for seamless storage.

"What's interesting about Egnyte is that it embodies a lot of the ideals of the entrepreneurs and pundits around cloud — namely, that it should be pay-per-use, self-service, and simple to use with easy-to-understand payment," says Frank Gillett, vice president and principal analyst at Forrester Research. "These are the attributes that makes it interesting. Egnyte has standardized and streamlined the whole process."

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Detailed coverage of all these companies.
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6. Elastra

HEADQUARTERS: San Francisco
WHAT IT OFFERS: Elastra Enterprise Cloud Server (ECS), a software platform that automates the allocation and management of application and related resources in private and public clouds.
HOW MUCH IT COSTS: Metered, pay-per-use pricing; an edition of Elastra's Enterprise Cloud Server is available free to Amazon Web Services (AWS) users.
WHY WE'RE WATCHING IT: An IT management technology start-up to watch for 2010, Elastra holds the promise of making cloud computing easier to use and more accessible overall, but especially to companies with lightly staffed IT organizations that want to support cloud computing initiatives.

Elastra has gained recognition for its ability to simplify the processes of creating, managing and allocating shared resources. In an April 2009 report, Forrester identifies Elastra as one of several "cloud-in-a-box" solutions that help enterprises build on existing resources and provide a quick path to an internal cloud. In particular, the report points out Elastra's ability to combine architecture and life-cycle management with cloud automation tools that help with design and deployment, monitoring, consumption-based metering and management of commercial software licenses.

7. GoodData

HEADQUARTERS: San Francisco
WHAT IT OFFERS: GoodData On Demand, a cloud-based platform for business intelligence (BI) applications
HOW MUCH IT COSTS: Monthly fees range from $500 per project for a 250MB data warehouse to $2,500 per project for a 20GB data warehouse.
WHY WE'RE WATCHING IT: BI projects can be notoriously tricky and they don't come cheap, either. Upfront licensing, consultative and ongoing costs can be limiting, if not prohibitive factors for many companies. Enter BI in the cloud. Available on demand, BI as a service can be far less expensive yet much quicker to implement and easier to use than complex, legacy BI applications. BI in the cloud means no software to buy, licenses to maintain or related infrastructure to support.

In GoodData's case, users place their data within a single instance of the company's secure, hosted BI platform. Once their data is safely nestled in the cloud, companies then have the ability to build and manage multidimensional data models, analyze data — collaboratively if desired — and share results via user-friendly dashboards.

8. Kaavo

HEADQUARTERS: Stamford, Conn.
WHAT IT OFFERS: Infrastructure and middleware on demand (IMOD), SaaS offering for managing applications in the cloud, plus an on-premises version for managing applications within private clouds.
HOW MUCH IT COSTS: Online self-serve model pricing starts at $100 per month.
WHY WE'RE WATCHING IT: Kaavo addresses the dual pain points of managing and securing application data in the cloud. Its goal is to provide a simple self-service interface into the cloud plus deliver security and role-based access controls, automated systems monitoring and n-tier, application-centric configuration capabilities enabling system deployment online via a single click.

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Gartner recently gave the thumbs up to Kaavo's top-down IMOD approach. "The technology can start a complex system that consists of multiple tiers (i.e., a database tier, an application tier and a Web tier), as well as the firewalls that may exist between each tier without requiring the use of scripts," Gartner said in the report.

9. Nasuni

HEADQUARTERS: Natick, Mass.

WHAT IT OFFERS: Nasuni Filer is a cloud storage gateway that provides file access to select cloud storage services.

HOW MUCH IT COSTS: $300 per month over the cost of a supported cloud storage service.

WHY WE'RE WATCHING IT: Nasuni addresses a challenge facing many would-be cloud storage users: the ability to move data into and out of the storage cloud in a simple, consistent manner.

While some cloud storage providers do support access via the CIFS, NFS or FTP, those gateways are fairly rudimentary, says Ray Lucchesi, president of Silverton Consulting. Nasuni not only offers an independent means of mapping CIFS files into storage clouds from Amazon, Iron Mountain, Nirvanix and Rackspace, but tops that capability off with nifty features such as a local data cache, file snapshot, data compression and encryption, and cloud management services.

10. Navajo Systems

HEADQUARTERS: New York

WHAT IT OFFERS: Virtual Private SaaS (VPS), for SaaS application data security.

HOW MUCH IT COSTS: 10% on top of the SaaS provider fee.

WHY WE'RE WATCHING IT: For many enterprises, privacy and regulatory concerns are a deal-breaker for public cloud services. Navajo intends to change this with its unique approach to SaaS application data security.

Navajo has developed a scheme for transparently encrypting before transmitting sensitive application data to a SaaS provider. Likewise, encrypted data returning to the user within the SaaS application responses is decrypted. The SaaS provider does not have an encryption key, making the data undecipherable to the cloud servers.

In other words, data at rest within the cloud remains encrypted and, because the sensitive data hosted outside of the company is unreadable, regulatory compliance is enforceable, says Dan Gross, Navajo CEO.

11. Symplified

HEADQUARTERS: Boulder, Colo.

WHAT IT OFFERS: SinglePoint, an integration-as-a-service platform for extending enterprise security policies and administration into the cloud.

HOW MUCH IT COSTS: Available on a monthly per-user charge.

WHY WE'RE WATCHING IT: Symplified addresses issues of access to SaaS applications, deactivation of user accounts, scaling out user access, and managing user identities and policies from a central point.

Integrating existing security policies and administration with cloud applications and data should provide IT organizations the enterprise-class cloud security they desire.

12. Terremark Worldwide

HEADQUARTERS: Miami

HEADQUARTERS: Miami

WHAT IT OFFERS: Enterprise Cloud, a high-end hosted private cloud, plus vCloud Express, a pay-as-you-go cloud service aimed at development teams and departmental needs.

HOW MUCH IT COSTS: Enterprise Cloud pricing depends on the size of the dedicated resource pool; vCloud Express starts as low as 3.6 cents per hour.

WHY WE'RE WATCHING IT: Terremark is a good example of the hosted private cloud model — an appealing option for enterprises that want the benefits of cloud computing without the hassle of maintaining the infrastructure internally. In a recent test conducted by ExtremeLabs for *Network World*, testers found Terremark delivered speed and offered the best administrative portal, as well as the lowest cost of clouds tested. "Terremark's rapid speed of delivery (three days) earned the product high marks as it delivered quickly and to spec — all things we like in a cloud vendor," the testers said.

13. Viewfinity

HEADQUARTERS: Waltham, Mass.

WHAT IT OFFERS: Viewfinity, a SaaS suite for systems management, privilege management and user migration capabilities.

HOW MUCH IT COSTS: Viewfinity Systems Management is free for up to 50 PCs, and then $48 per desktop per year; Viewfinity Privilege Management costs $28 per desktop annually.

WHY WE'RE WATCHING IT: At most enterprises today, a far greater percentage of the budget goes toward keeping systems up and running than toward business-enhancing initiatives. Viewfinity, by enabling client device management from the cloud rather than from an internal systems management infrastructure, can ease the burden.

Once an organization has registered for the cloud service and has installed agent software on target client devices, systems administrators can perform typical desktop tasks via the Viewfinity software delivery platform over secure Web links. The agent install is an on-demand process using existing Active Directory and network infrastructure, and completes within minutes.

14. VirtualArk

HEADQUARTERS: San Francisco

WHAT IT OFFERS: The Virtual Ark SaaS Application Management Platform, which combines SaaS-enablement of enterprise applications on clouds with managed services expertise.

HOW MUCH IT COSTS: Pricing specifics unavailable.

WHY WE'RE WATCHING IT: While SaaS applications are available for just about any IT and business need imaginable, sometimes enterprises just don't want to go there. They've grown comfortable with their enterprise applications. Start-up Virtual Ark has an answer — a value-added service for delivering a customer's enterprise applications in a SaaS model, complete with pay-as-you-go pricing.

To date, SaaS-enabled applications include those for CRM, ERP and financial management.

15. VMLogix

HEADQUARTERS: Palo Alto, Calif.

WHAT IT OFFERS: VMLogix LabManager — Cloud Edition, a virtual lab management solution.

HOW MUCH IT COSTS: Pricing available upon request.

WHY WE'RE WATCHING IT: Like CloudShare, VMLogix is targeting the test-and-development arena. Virtual lab management software lets users create virtual instances of physical infrastructure on demand.

"Virtual lab management continues to prove itself as a rare, real, breakthrough use of technology revolutionizing the computing industry and the enterprise," says voke Research analysts in a March 2010 report. ■

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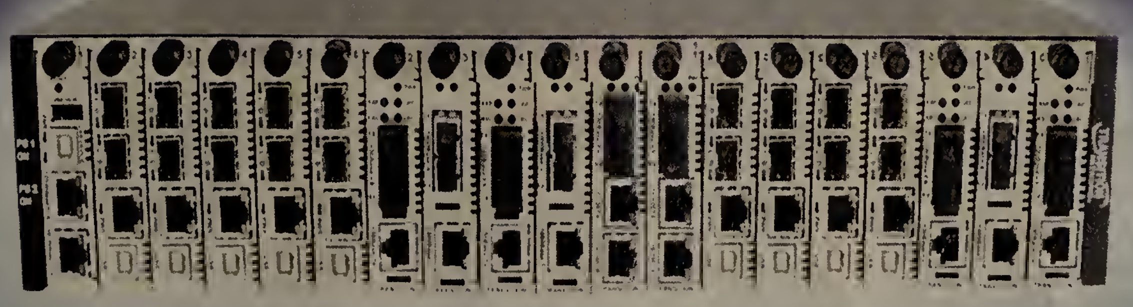

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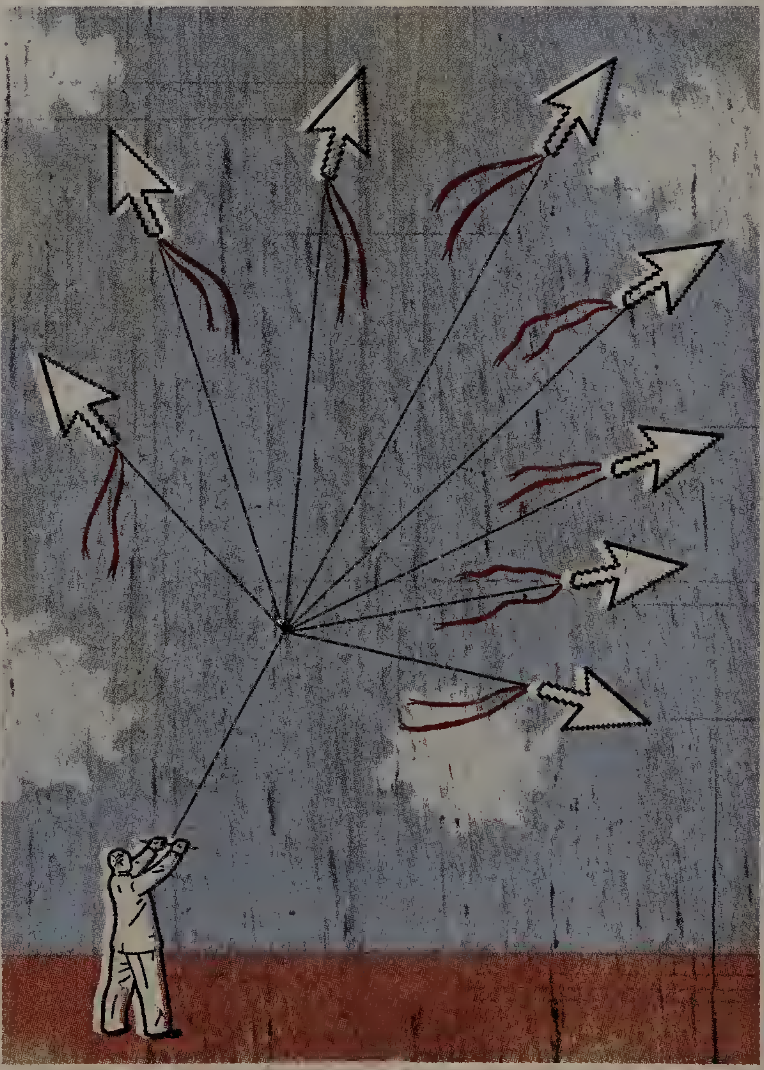
Cloud management tools weather real-world tests

RightScale, Tap In Systems, Cloudkick provide control of public cloud resources

~ BY TOM HENDERSON AND BRENDAN ALLEN ~



Renting raw compute power on the public cloud is pretty easy to do. The challenge is to deploy, manage and take down jobs that are hosted in the cloud. In this ground-breaking test, we set up public cloud accounts at Amazon, Rackspace and GoGrid, and tested management services from RightScale, Tap In Systems and Cloudkick under real-world conditions.

In our first cloud computing test, we reviewed virtual private clouds or enterprise clouds from Rackspace, Terremark and BlueLock. In that scenario, enterprises were looking for dedicated resources for persistent applications. The vendor provided a full menu of compute resources, operating system instances and security options, among other things. We ordered what we wanted and the vendor built or provided the infrastructure. Everything was determined in advance, and billing was on a monthly basis.

Public cloud resources, by contrast, are completely a la carte. Everything is up for sale, piecemeal. You can use the public cloud vendor's API, choose an operating system version, memory, storage, bandwidth, security metrics, IP and DNS addressing, and perhaps a place to store your stuff when you're done.

We signed on to Rackspace, GoGrid, and Amazon Web Services (AWS) with a simple credit card and verification step. We rented compute resources by the hour. The meter starts running as soon as the resources are used.

As in our enterprise cloud test, we chose to deploy Linux/Apache/MySQL/PhP (LAMP) instances.

The management tools that we tested let IT administrators look at rented resources, check them for status and utilization in order to optimize resources and perhaps balance what's online and being used. One way to think about these products is as cloud-based analog to traditional network management software, such as Tivoli or CA/UniCenter. The focus is on monitoring processes and sending alerts.

We also found that RightScale and Tap In have capabilities that go far beyond these basic management functions. Running under the aegis of the public cloud vendor's API set, or directly through agents on the operating system instance, these services can control the process of building, deploying and monitoring usage, then shutting down jobs in a timely way.

In an upcoming test, we will review these advanced application or job-focused management capabilities provided by RightScale, Tap In and others.

Our findings in this test are that RightScale impressed us most with its overall control and deep understanding of specific cloud vendors such as Amazon. Tap In Systems has more breadth in terms of different clouds that can be used; it's just not as easy to use. And we liked Cloudkick for its simplicity and ease of use.

RightScale Cloud Management Platform

RightScale sets itself apart from the competition through its mastery of the cloud provider's API and control plane, coupled with templated OS instance generation and monitoring. RightScale's process control of Amazon public cloud resource was impressive. One starts by taking a process job and breaking it down into components. The beauty of cloud computing is that a 100-hour job on a single machine can be broken down into a one-hour job on 100 server instances (where that's feasible) at the same cost.

But provisioning the server instances,

CLEAR CHOICE TEST

seeding data, doing the job, getting the outputs, then tearing down the servers would be impossible to do without templates. RightScale has a library of approximately 50 server templates, and RightScale's partners provide an equal number. One takes a template, imports it and uses it to spawn a server instance. The template can be edited to provide monitoring characteristics that can be used to watch the processes. The server templates include what RightScale calls RightScripts, but you can add and modify more at your convenience. Some scripts are in Ruby, others in perl, bash. As an example, we imported a LAMP server template (CentOS Linux, Apache, MySQL and PhP), then chose characteristics called inputs where we could choose its location on Amazon's server, the code package, data dump file, schema, processes to be monitored after setup, PhP modules to load, MySQL username/password — more than 50 characteristics.

We could save the modifications as a revision, CVS-style. We could roll back to previous revisions of the template if we desired. We could then launch the instance into Amazon's cloud. RightScale monitors the Amazon Web Services API so that we could monitor resource consumption and relate that to budgeted consumption — and therefore, cost.

Once the instance template was built and stored, there were three steps: boot process, operational and then subsequent decommissioning. An audit log shows each part of the steps. There are more than 300 scripts that do everything from backing up databases to the Amazon S3 storage cloud, installing different server processes (such as MySQL and Hadoop grid-based distributed processes), setting privileges, or installing locally sourced components. Since Amazon supports Linux CentOS, as well as Windows 2003/2008 (not R2) server license rental, we had our choice of server substrate to run application jobs via our template choices. Licensing provisioning isn't needed, as it's included in the Amazon price.

And as Amazon has a seeming superfluity of operating systems choices, the capability to service jobs on a variety of platforms was made simple.

When monitoring the processes we spawned by our deployments, we found that RightScale allowed us to view the servers by name. We could then watch histograms of 19 types of monitored processes. RightScale uses the FOSS CollectD RDDtool plug-in application, and its numerous monitored object characteristics that collect data and feed it to the histogram graphs.

RightScale understands the Amazon API very well, and alerted us as we tested monitoring in a way that was better and more understandable than its competition.

Philosophically, RightScale believes in cloud portability, a concept where cloud vendor resources are used deeply in terms of vendor-specific resources, but broadly, meaning that multiple cloud vendors are interchangeable. We weren't able to check that thoroughly as the only other public cloud vendor that RightScale is compatible with is in the alpha stage — Rackspace.

The RightScale Web user interface worked well for us. Importantly, most components of the user interface have Web-based help available so that procedures are clear. RightScale's scripts can also be modified. These and most RightScale actions used can be bookmarked inside the user interface for re-use. RightScale lists the groups of instances across all clouds, server and instance templates, and more importantly, shows CPU memory, disk and application-specific usage for each instance.

This is an application that begs for a large-screen monitor for all the data that it can display. Server arrays are also manageable across instances, groups or clouds. There is alert-based and queue-based messaging regarding server conditions. Alerts are triggered and queue messages are job control actions, such as spawning a new worker instance when another queue is taking too long to complete something.

Tap In Systems Cloud Management Service

Tap In Cloud Management Service allows you to connect to Amazon Web Services, GoGrid, OpSource, Terremark and 3tera Applogic clouds. We tested with AWS and GoGrid.

Tap In Systems doesn't provide instance launching, just straight-up cloud monitoring. Tap In Systems uses cloud modules installed on the Tap In System server that talk to system agents on the server instances.

As an example, the agent for Amazon EC2 gets information about each instance in your account with information provided by the EC2 API. It's also possible to see CloudWatch data for your instances in the Web interface; CloudWatch is an Amazon optional monitoring API.

There are two components to Tap In's Cloud Management Service, a Web user interface and a Java-based QuickView application. Tap In's agent for GoGrid is similar to the Amazon agent in that it gets information about each instance and displays that information in the QuickView client or the Web user interface.

NETRESULTS

Product	**Cloud Management Platform (Enterprise Edition)**	**Cloud Management Service**	**Cloudkick SaaS application**
Company	RightScale www.rightscale.com	Tap In Systems www.tapinsystems.com	Cloudkick www.cloudkick.com
Price	$500 to 5,000 initial integration, access, and support fee plus $500 to 3,500 monthly fee.	49 cents per instance, per hour at Amazon;$352 per month at GoGrid.	Free download to $599 a month.
Pros	Articulate monitoring of operating systems and applications; strong support for production batch.	Broader cloud vendor support; decent instance monitoring.	Broad cloud vendor support; great console user interface; rapidly understandable.
Cons	Limited number of cloud vendors supported.	User interface needs work, but is improving.	Comparatively limited application platform monitoring support; instance launching foibles.

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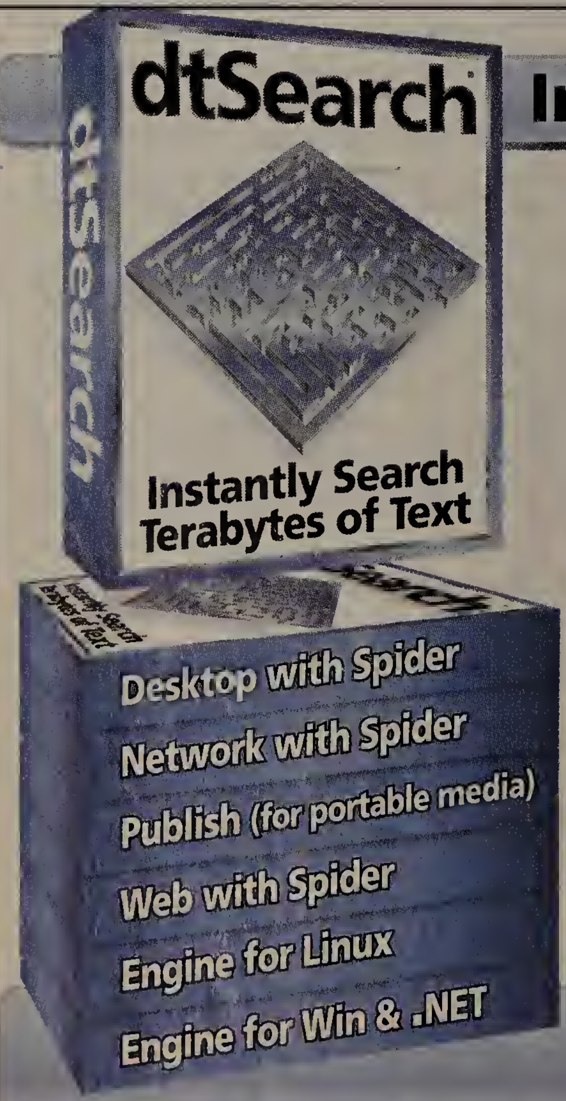

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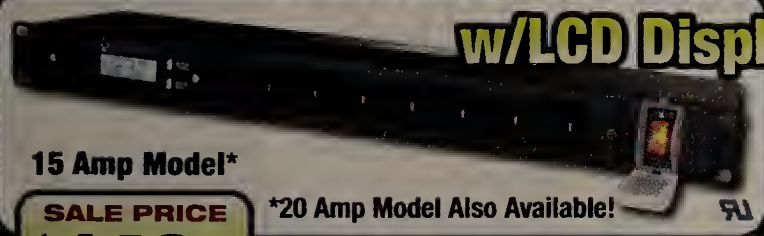

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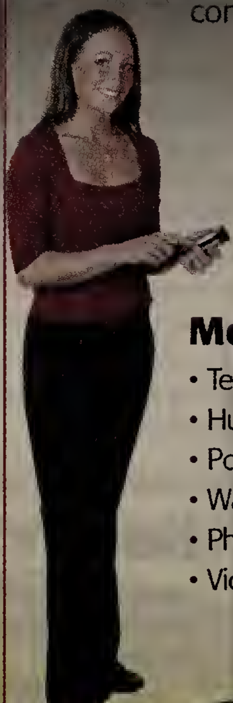

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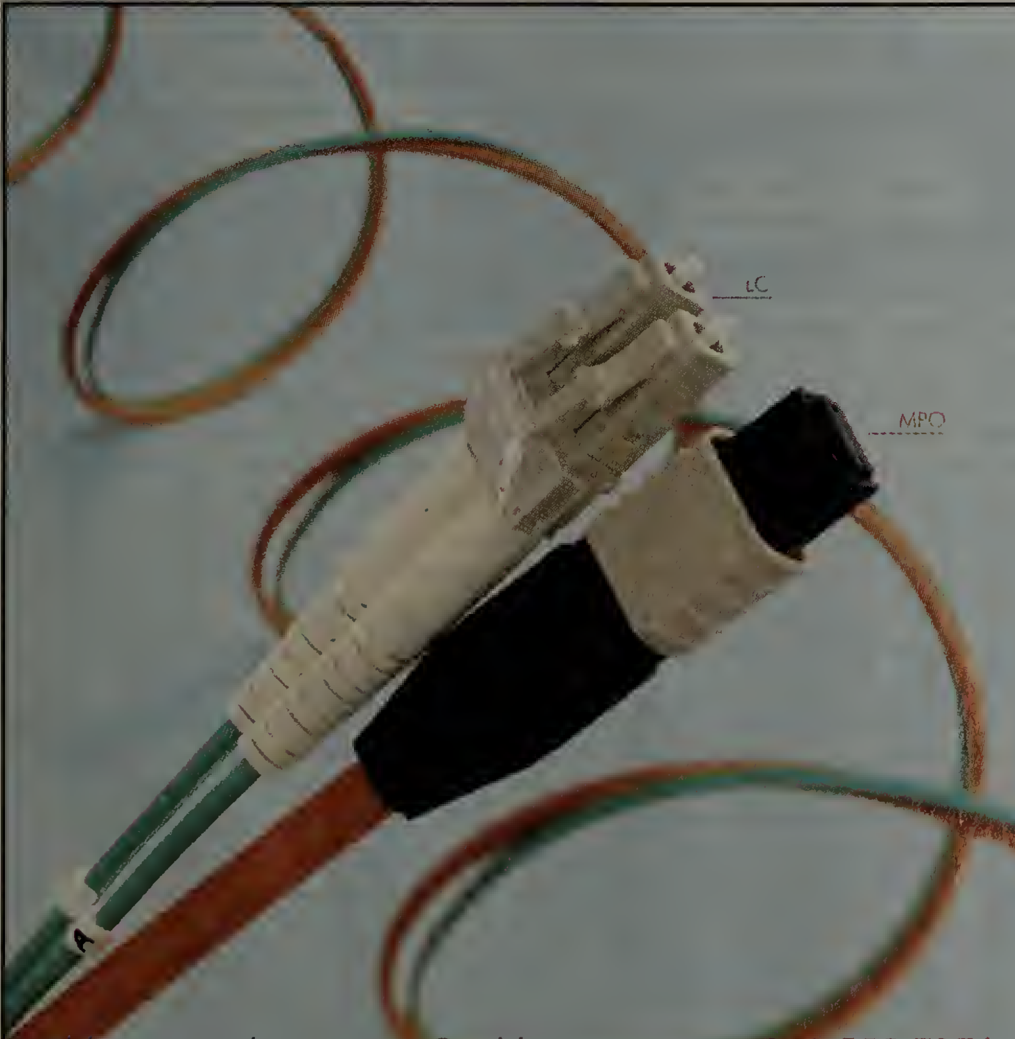

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Tap In agents, installed directly into each cloud instance, are actually scripts that gather detailed information and send it to the management server. One problem we discovered is that the agents aren't daemons and have to run as scheduled jobs in Windows. With Linux, the cron job scheduler handles this function.

The operating system provides more information than the agents do, but unlike RightScale, Tap In doesn't pick this information up. Although it's possible to integrate with open source network monitoring applications such as Nagois, Big Brother or Ganglia, the documentation doesn't say where to get them or how to install.

And for Windows, it's possible to integrate with MOM or Systems Center Ops Manager through the powershell script, which gathers the information from MOM or SC Ops Manager. But again, documentation is scarce. Monitoring Windows cloud instances is augmented, however, by a Windows powershell script that sends information regarding CPU, memory, disk and virtual memory to the Tap In server.

Like the Linux script, you have to set up a task to have it run every so often so that the script will run and update the statistics. A pair of ports is required to be open on each instance controlled in this way, 9001/9009, which may be a small security risk, depending on how it's configured. We could modify the script to send more statistics to the server, which are accumulated and displayed in the Web interface or their client user interface.

We found a small problem with the agents, as their logic doesn't seem to permit time stamping data, so that, for example, if the server or instance is shut down, the console of events displayed in the TIS Web page or QuickView app will still think the instance is working.

There are two main ways of viewing events. One is the Web interface, which is also where most of the configuration takes place; the second way is through the QuickView client, which is a Java app. In both user interfaces, the tabular data is displayed under a histogram, unfiltered. View settings with chosen and re-orderable columns would be handy.

The Web interface is a bit confusing and we feel it needs some more polish. Event monitoring is not so pretty either. It's organized into cloud vendor groups like GoGrid, Amazon, and each individual system agent. However, even if a system agent is installed on an Amazon or GoGrid instance, the instance data collected by the agent will not be displayed under the labels Amazon or GoGrid, but separately. The QuickView client connects to the Tap In server to receive events. Unlike Web interface events, in this case, we are able to order the columns around. There are also SQL filters to go through the data.

Cloudkick

Cloudkick is a basic monitoring tool that can manage public clouds including Amazon EC2, GoGrid, Slicehost, Rackspace and more. We tested Cloudkick with Amazon EC2, GoGrid and Rackspace and had reasonable, if comparatively elementary, success with it. We tested the developer edition, but there are several editions, based on the number of nodes monitored, messaging, and users of the monitoring tools.

How We Did It

We obtained our own accounts at Amazon, GoGrid and Rackspace. We connected to each vendor's product through an Xfinity broadband connection from our lab, or a proxy connection via our network operations center at nFrame in Indianapolis. We spawned numerous types of instances and looked at how each product controlled instances through their life cycles, as well as how well they monitored them and through what processes.

We installed it onto Amazon EC2 first. After entering our Amazon EC2 credentials (Access Key ID and Secret Access Key) and later our GoGrid info (API key and Shared secret), and then our Rackspace API key and username, the Cloudkick Web interface started collecting information about our running instances on each provider.

There is also a new hyperlink (https://www.cloudkick.com/hybrid-Cloudkick), which is supposed to be able to connect machines in your data center to the Cloudkick interface via the Cloudkick API. One installs the agent onto a physical Debian/Ubuntu or CentOS/RHEL box and you can see the operating system plus data in the Web user interface. Simple as pie.

Besides the basic information provided by the public cloud vendors (in Amazon's case, that includes IP address, DNS names, instance name/ID, creation time and a few others) through their APIs, Cloudkick has Linux agents that are installed in Debian/Ubuntu or CentOS/RHEL instances. Cloudkick Windows agents are said to be coming soon. The agent is pretty easy to install with detailed instructions on its wiki.

Even without the agent, it's possible to monitor ssh, http, https and ping. Details such as CPU, memory, network, disk, IO and others are only available when the agent is installed. Custom plug-ins are also able to be created to monitor whatever one would like.

After a Cloudkick instance agent was installed, we could view some diagnostics, graphs and other aforementioned information on the main overview page for that machine. Cloudkick also has a neat feature called a Web terminal for ssh, which launches a terminal similar to a Quake-style (the 3D video game) pull-down console that will connect to your instance once you install an ssh key provided through the browser-based Cloudkick user interface.

Another neat feature is the ability to color code a node. When there are a lot of instances, it's possible to quickly find the one(s) you need. Dragging and dropping the nodes (instances), it is also possible to re-order the list. We could make and set tags for each node, as well.

Also, we could terminate or reboot the instances (without agents installed) from within the Cloudkick Web interface.

Cloudkick doesn't really provide the capability to launch new instances via its management service. The only images available that can be launched through Cloudkick on Amazon EC2 are Ubuntu 8.04 and 9.10. Although it is possible to use a custom AMI ID (Amazon Machine Image ID) to launch new instances, we couldn't set up or choose a ssh key pair or security group.

This means that we couldn't ssh into our instance or if we have certain ports we wanted open, we have to go into Amazon's console to change its default "Cloudkick" security group (the keypair can't be changed once an instance is launched). Therefore, launching its EC2 images are useless without knowing the passwords. And since most AMIs use only a ssh RSA key to connect, it was basically not possible to connect to Cloudkick's provisioned instance. (And we couldn't use the Web terminal either since we couldn't connect to install the key.)

We found it's easier to create instances through Amazon's AWS console. This part of Cloudkick's control process needs work. Instance launching via Cloudkick seemed to work better on Rackspace than Amazon.

Overall, the main idea behind Cloudkick's application is to put all your cloud information in one place and be able to monitor it, but Cloudkick still has a ways to go before it works well enough for IT administrators. ■

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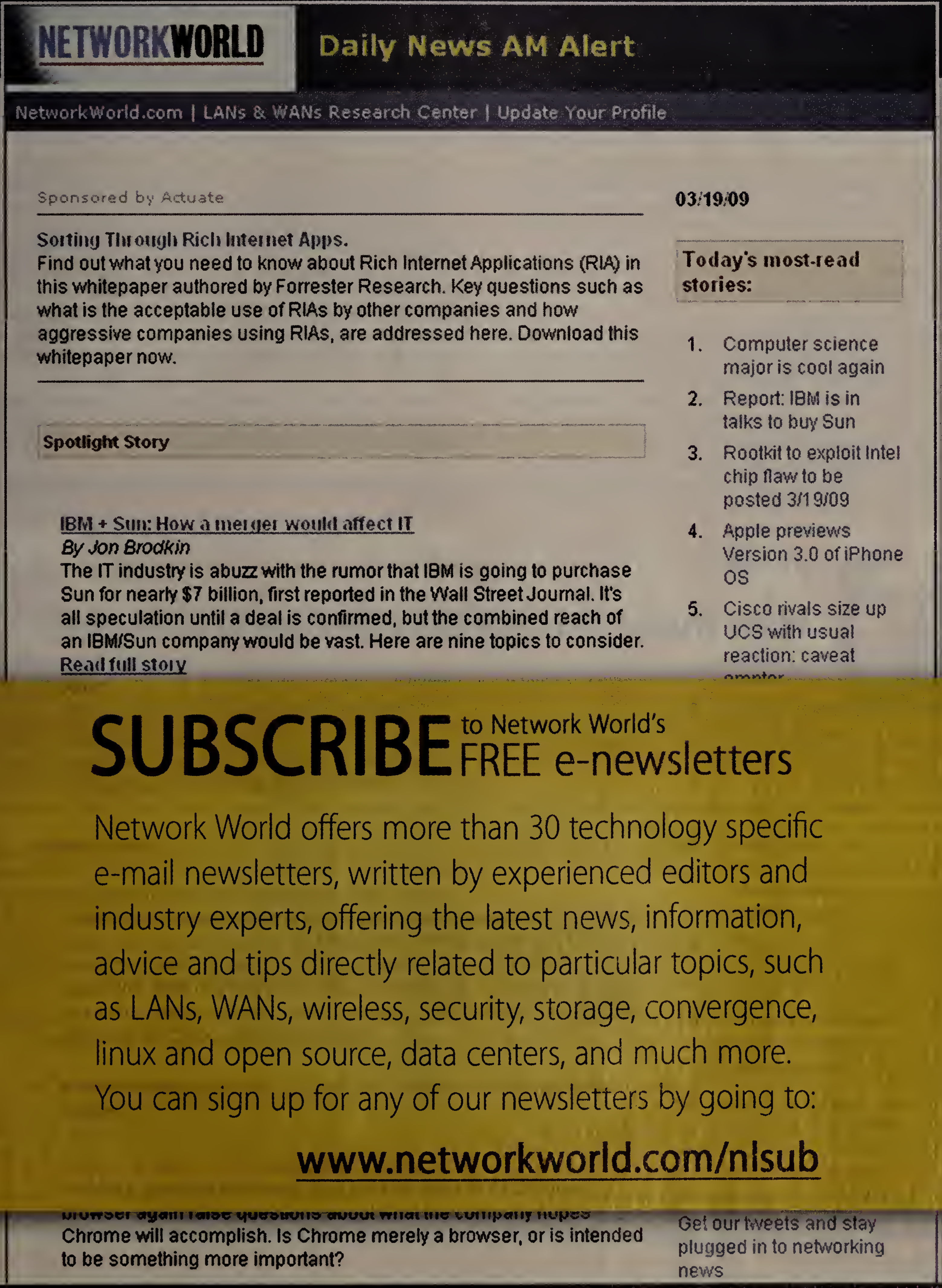

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BACKSPIN | BY MARK GIBBS

Rolling the computerized dice

IT'S BEEN quite a week. On Thursday we saw the Dow jump off a cliff reputedly because some numbnut at a brokerage house went to place a sell order for $16 million in futures tied to stock indexes. It has been claimed that he placed a sell order for $16 billion!

Not surprisingly, nothing good could come of a faux pas of that magnitude: It is theorized that computerized trading systems saw the huge transaction and blindly followed their programs resulting in a sell-off that, along with the Greek financial crisis, pushed the Dow down more than 1,000 points!

According to the *Wall Street Journal*, other forces were also in play: "Accelerating the declines, high-frequency hedge funds, which use computers to trade at super high speed, appeared to pull back from the market as prices collapsed. These hedge funds have grown to account for a significant amount of trading volume, and their absence likely created a void into which prices fell."

It was amazing to see a security like Accenture, which, at 2:46 p.m., had been trading at $39.38, plummet to just 1 cent at 2:49 p.m., and then rebound to $39.51 at 2:50 p.m.

Several things about this amaze me. First, if the trader did, indeed, place this gonzo sell erroneous order how could it have been three orders of magnitude larger than they intended? I could understand one order, maybe even two, but three? To do that you have to add extra digits, three of them to be precise ... perhaps the trader was a very bad typist with very large fingers and very bad eyesight.

Second, how could the order entry system not have some kind of validation routine? Surely billion dollar orders are somewhat rarer than million dollar orders. You'd think that the software would respond to such an order with something like "Are you really sure you want to do this because it's kind of large?" or, better yet, "Dude! Are you kidding?!" But nope, obviously nothing of the kind happened.

Third, why do we have such apparently out-of-control automated trading? It seems kind of obvious that automating something like this comes with some serious dangers. I know to the greedy #^&*%%*& on Wall Street these risks seem irrelevant when enormous profits are possible through computerization, but the real people taking the risks aren't them — it's you and me. If the stock market implodes we'd see our investments tank (again) to be followed by a credit squeeze that would bring our economy to its knees (unless you feel that's where we are at present, in which case, I guess it would be more of a face plant).

I am not against automation. I'm not against profits. I am against allowing greed to play fast and loose as it pleases and use computerization in a way that every IT person knows is extremely risky.

If a simple data entry error can send the market into free-fall so easily you can only imagine what total chaos might be possible from more subtle, complex and harder to predict snafus. What if the next cock-up sends the market down by 2,000 points? Sure, in a situation that catastrophic the markets would be automatically shut down (at least, that's what we hope would happen), but with the economy in such a bad way at home and abroad we can't afford this kind of instability.

I doubt anything will change in the near future when it comes to computerized trading, and perhaps we'll be lucky and the financial apocalypse will never happen. Then again, it just as easily might. ■

Gibbs doesn't gamble in Ventura, Calif. Your wager to backspin@gibbs.com.

NETBUZZ | BY PAUL MCNAMARA

How many zettabytes can dance on a pin?

PERHAPS YOU'VE seen the headlines: The petabyte will soon need to step aside in favor of the zettabyte for use in describing humankind's ever-expanding yearly output of digital information. And, as we all know (ahem) a zettabyte equals 1 trillion gigabytes, or a 1 followed by 21 zeroes.

So what do we make of that? ... No, really, what does a zettabyte mean in the meaningful sense of mean? EMC took a swing at answering the question last week in releasing an IDC report it commissioned called "The Digital Universe Decade — Are you ready?"

Let's just say it did the best it could.

In a general, I understand that a zettabyte is really big and that the comparisons being offered are really big things, too, albeit big things that might be a tad more accessible to my limited grasp of such scale. The comparisons are helpful, all right; it's just that they don't help all that much. Let's take a look at what was offered in an EMC press release: "The amount of digital information created in 2010 (1.2 zettabytes) will equal: The digital information created by every man, woman and child on Earth 'tweeting' continuously for 100 years."

The first problem with this is you need to know the world's population, which today straddles the 7 billion mark. You also need to know that there's nothing other than trendiness calling for all the world's people to drop what they are doing and spend a full century tweeting, as opposed to say, sending e-mail or writing haiku. And, of course, the fact that the calculation comes out to a nice round 100 years — not 96.5, not 103.7 — suggests that maybe someone decided to wing it here, because, well, who's going to even try to check the math on this one?

The next attempt borrows more from the tried-and-true football field approach, placing the 1.2 zettabytes of data on a lot more iPads than Apple could even think about building before meeting its unmet commitment to jilted international buyers: "75 billion fully-loaded 16 GB Apple iPads, which would fill the entire area of Wembley Stadium to the brim 41 times, the Mont Blanc Tunnel 84 times, CERN's Large Hadron Collider tunnel 151 times, Beijing National Stadium 15.5 times or the Taipei 101 Tower 23 times."

What have we learned here? OK, 75 billion iPads would be more than enough to give seven to every man, woman and child on the planet, provided Apple can ramp up production. Nothing to sneeze at. But the clearest thing we learn is that the Beijing National Stadium could steal Wembley's lunch money.

Next up, we turn to TV for a familiar reference point: "A full-length episode of FOX TV's hit series "24" running continuously for 125 million years."

This didn't help at all in my quest to understand the magnitude of a zettabyte, perhaps because I've never watched so much as a nanosecond of "24."

And here's the last one: "707 trillion copies of the more than 2,000-page U.S. Patient Protection and Affordable Care Act signed into Law in March 2010. Stacked end to end, the documents would stretch from Earth to Pluto and back 16 times or cover every inch of the United States in paper 3 feet deep."

That just made my head hurt. Let's give up. ■

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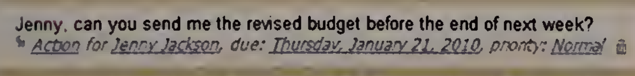

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Action for Jenny Jackson, due: Thursday, January 21, 2010, priority: Normal

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